

REPORT

OF THE FORTY-NINTH

MISSOURI STATE UNIVERSITY
CATALOGUE,

TO THE

GOVERNOR OF THE STATE OF MISSOURI

1890-1891

ORGANIZED 1840.

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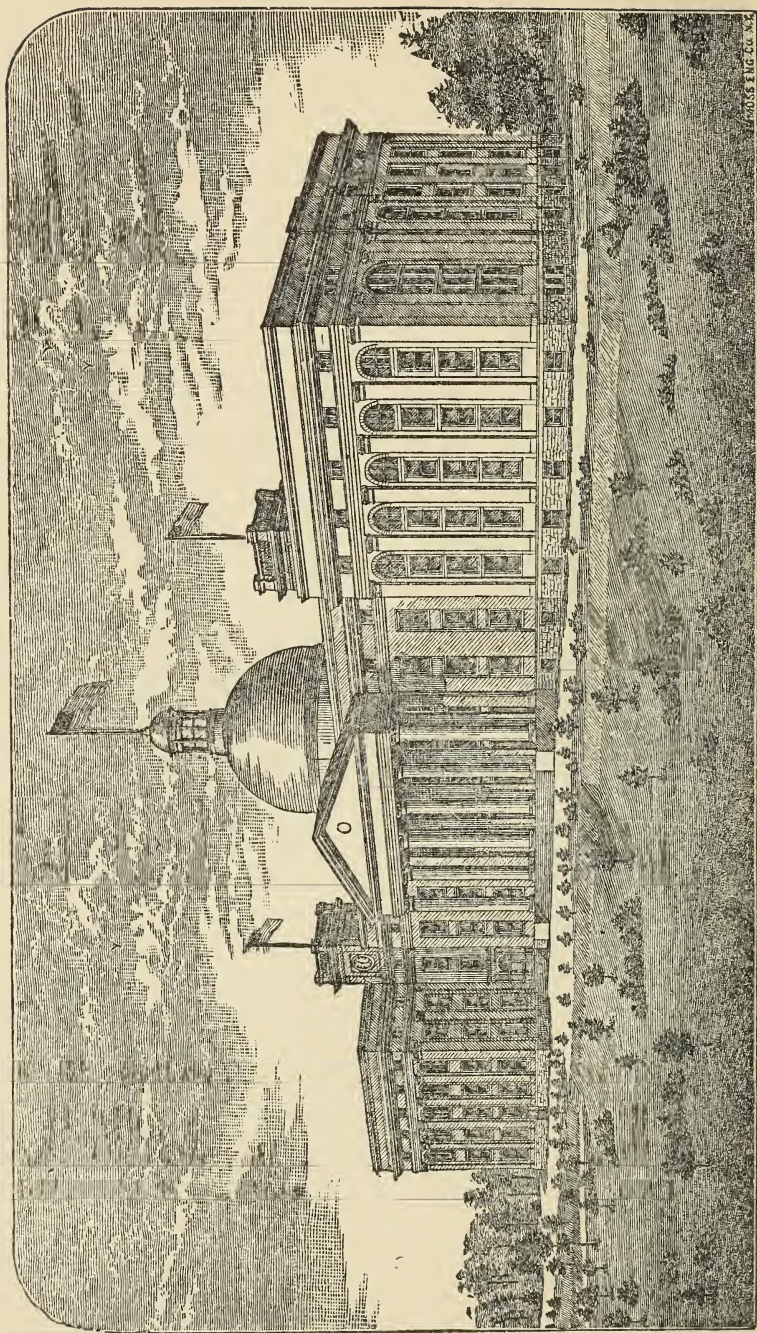
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THE UNIVERSITY OF THE STATE OF MISSOURI.

The cut on the opposite page presents a north front and west end view of the University edifice as it appears since enlarged and improved. The building is four stories high, with basement; is located in the south suburbs of Columbia, and faces north, presenting a front of 347 feet, the front of the old building being only 157. The new chapel or auditorium constitutes the east or left-hand wing, ground floor and gallery, with library hall above—in short, the portion of the building to the left of the eastern tower. Size of chapel, 75 feet front by 110 deep, and capable of seating about 1,500 persons. Seats are hinged opera house and amphitheater style. Between the chapel and the old building there is an entrance and stairway hall of 20 feet, running back the entire depth of the chapel. A similar hallway, under the western tower, also intervenes between the west end of the old building and the new west wing—this wing also presenting a front (including hallway) of 95 feet; depth about 115. A hallway of 23 feet width, running east and west, divides the west wing—the entire portion of it, north of this hall and fronting north, being the museum, the size of which is 75 by 47 feet. Size of wing south of east and west hall, which will be divided into recitation rooms, 75 by 45 feet. The whole building is lighted by electric light, and warmed by steam with the Heine boilers and the Bundy radiators.

[Organized 1840.]

ANNUAL CATALOGUE

OF THE

UNIVERSITY OF THE STATE OF MISSOURI

AT

COLUMBIA, MISSOURI,

1890-1891.

ANNOUNCEMENT FOR 1891-92.

The Academic, Agricultural, Medical, Normal and Engineering schools will open the second Tuesday of September, 1891. The Law school will open October 6.

The departments of instruction are :

1. The Academic schools of Language and Science.
- 2 The Professional schools of Agriculture, Pedagogics, Engineering, Art, Law and Medicine ; and at Rolla the School of Mines and Metallurgy.

These Schools of the University are open to young men and to young women. Excepting in the Law, Medical and Engineering schools (each \$40.00) and the Commercial school, the entire expense for the year for tuition and contingent fees is \$20.00.

Board in private families, \$3.00 to \$4.50, and in the clubs at about two-thirds of these rates.

In the means of instruction and illustration, none of the institutions of learning in Missouri have equal advantages. The association of the several schools with each other is deemed a circumstance of decided advantage. When, for example, a student has entered the Law or Medical school, he has access to all the other departments of instruction without any additional expense.

Commencement day is the first Thursday of June.

Please send for catalogue to the *Librarian*, Missouri State University, Columbia, Missouri.

J. S. BLACKWELL, Chairman of Faculty.

REPORT OF THE BOARD OF CURATORS.

To His Excellency, DAVID R. FRANCIS,
Governor of Missouri:

SIR: In compliance with the provisions of section 8751, of the Revised Statutes of Missouri 1889, the Curators of the University of the State of Missouri, have the honor to submit the following report of the progress, condition and wants of said institution for the year ending June, 1891.

Separate reports of the various departments of the University, exhibiting the course of study prescribed in each, and the number and names of officers and students, the amounts of receipts and disbursements for the year ending December 31, 1890, together with much other useful information, will be found in their proper order in the following pages of this report.

For convenience, the following facts are here condensed:

Total number of students enrolled during the year at Columbia.....	487
Total number of professors employed during the year at Columbia.....	19
Total number of assistants for the year at Columbia.....	11
Receipts for the year ending December 31, 1890.....	\$85,755 53
Disbursements for the year ending December 31, 1890.....	85,994 13
Total number of students enrolled during the year at Rolla.....	80
Total number of professors employed during the year at Rolla.....	3
Total number of assistants employed during the year at Rolla.....	3
Total receipts for the year ending December 31, 1890.....	15,448 17
Total disbursements for the year ending December 31, 1890.....	16,781 71

The University has been singularly fortunate in having through all its history a succession of able professors. To this cause is due in large measure its eminent success. The fact that for the last two years the institution has been without a president has emphasized this truth,

and justifies the observation that a learned and able Faculty earnestly devoted to their work are a first requisite in building up a great university. Buildings, apparatus and libraries are only helps. The stimulating, inspiring cause of growth and success lies in the brain and heart of the teacher. Spirit responds to spirit. Genius rises under the impress of genius. Any learning is dearly acquired through the help of a poor intellect. Weakness in the master not only fails of accomplishment of positive good, but it generates actual feebleness in the mental constitution of the pupil. No books can qualify a weak, insipid nature to be a suitable instructor and director of student life. Its influence is miasm its very presence is blight. The authority that tolerates it as an element of control in the presence of youth is criminally derelict to duty. Breadth of mind, strength of conviction, earnestness of disposition, deep spiritual intuition, intensity of spirit, love of the truth, and a noble and lofty devotion to human welfare, are the qualities from which alone true university success can reasonably be expected. It is not a question of knowledge simply; of far greater moment is character. Weight and force of character in the teacher induces forceful character and purpose in the student, and without these life is a failure. It has been and will be the constant aim of the Board of Curators to observe this law, and to present the University for public indorsement upon the greatness of its Faculty and the effectiveness of their work.

VACANCY IN THE PRESIDENCY.

During the last two years of vacancy in the presidency, the executive duties and labors have devolved upon the Faculty. The present high condition and popularity of the University attest the wisdom of their management. And we feel that it is but simple justice to them here to record our appreciation of their faithful and conscientious services, by which the reputation of the Institution for scholarship and the development of manly virtue and character have not only been maintained but strengthened and advanced. Their work has been more onerous and difficult, but they have met the emergency. And the Board of Curators have great satisfaction in a prosperity for which they have labored with so much anxiety. Our difficulties have been great and continuous. But the present dignity and power and advanced standing of the University afford a satisfaction that atones for past hardships and will make cheerful our future sacrifices until the State, by additional aids of needed buildings and improvements, shall fully prepare the University for her grand and noble future. And of this we feel confident, for the State has never been more liberal to her great Institution than during the last two years.

PRESIDENCY AND DEPARTMENTS.

And this summary of progress leads us to reflect upon the true relation of the Executive and the Collegiate departments. The University is one. As such the corporate scheme assigns to it a single head. But it is not all head. Are not the departments equally essential? Do not the greatest utility and effectiveness belong to proportionate development? A large brain has not been prized for worth or symmetry except in connection with a correspondingly large body. And of what practical benefit is a capacious head, when there are only weak or compressed limbs to obey its will? Where is the power of control? Where is the power of labor and execution? Certainly they should correspond the one to the other. But in any system like that of our University, there is danger from a very natural and constant tendency to divergence and inharmony of proportion. Great ability joined to the executive authority, however pure its motives, finds satisfaction in dominion and presses its exercise. The departments by degrees feel its contracting influence. But the departments are the real instruments of education. The professors do the actual work. Thus disproportion and inharmony are induced, the real laboring power and building activities are diminished by excessive control, and the general result is impaired. Besides, the executive authority, having become too conspicuous, is a mark not only for envy and jealousy, but its personal mistakes and defects are soon, in the public estimation, attributed to the University itself, and the President and the institution are bitterly criticised together as one. Change then becomes necessary, but the passion and anger of it fall upon the body equally with the head. The public interest suffers. The number of students is diminished. The University passes through a crisis.

What is the remedy? We believe it to be first in a correction of public sentiment, and next in a recognition of the departments, allowing to them a reasonable degree of elasticity and freedom of development, and holding them to a departmental responsibility to the Board of Curators and to public opinion. To correct public sentiment, it must be frankly considered and practically admitted that the President is not the University, but only an honorable member of it; that the office is not constituted for him, but as a means of high public service in which he is the servant, and as such to be held to an account as an individual without involving the whole University in his misfortunes or mistakes. Consideration of the presidential administration should be one thing; loyalty and duty to the University another. A prudent President may himself do much to lessen the evil by subjecting his

love and display of authority to its utility. The most useful President will thus be one who takes the public into his confidence, convinces it of his sincerity in its service, hiding himself behind the functions of his great office. He will not abate his just powers, but he will not use his power officiously or offensively. And lastly, he will recognize that "death loves a shining mark," and that every official career has a suitable time to end. His reputation should not rest mainly or obtrusively upon Faculty management, or government of the students. He should always allow the University to be greater than himself, having more anxiety for its success and reputation than his own. And he should be willing to promote all the interests of the institution by the combined influence and power of all the professors, that the people may see the University as a body of intellectual grandeur, and not as a costly stage for individual dramatizing. The President should not be local. He ought to be known to the people. The whole State is his college. The teachers of the State should admire him. The sympathies of the alumni should be drawn to him and their co-operation enlisted. On the other hand, subject only to the common purpose, the departments should have freedom to develop themselves to the highest degree. Every professor should have the opportunity to grow, to develop and to secure to himself and the University the reputation due to his ability and work. Great professors are no less essential than great presidents. The students of every department are entitled to the best ability possible. The departments should at all times be so ably manned that a vacancy in the presidential office would create no shock. And the professor who under this system has not force of character to develop an individuality in the University, to create reputation for it and draw patronage to it, should have his place promptly supplied by an abler man.

DEATH OF DR. M. M. FISHER, CHAIRMAN OF THE FACULTY.

It is with feeling of regret that we have to mention the death of Dr. M. M. Fisher, Professor of the Latin Language and Literature. He was elected Chairman of the Faculty on the 7th day of June, 1889, with the powers and duties of President, and continued in that office until his fatal sickness. He died on the 20th day of February, 1891. In his profession he was perhaps the most learned man in the West. A painstaking student at home, he had spent many months in Italy studying at the fountain sources. He understood the domestic, social, political and military life of the Romans as he knew his own country. He was familiar with all their history, poetry and philosophy. But common association did not assuage his boundless enthusiasm. With a vivacity

and earnestness springing from a continuous sense of novelty, he communicated his spirit to his students. In his presence lethargy and inattention were impossible. He was born to be an instructor. Diligent study qualified him for the task. Duty with him was pleasure. To do good was happiness. No man ever knew him do a rash act or utter an ignoble sentiment. He was a model companion of youth. He did not ask others to do what he did not habitually practice himself. His own conduct was the law he laid down; his own example the standard he set up. He did not thrust the truth on unwilling minds; he clothed it with such charms that the heart welcomed it. He did not drive; he led his students.

Life mingled in him its choicest elements, the love of labor and the love of truth. His presence was an inspiration; his word enthusiasm. His influence will long be felt in the University life. He nurtured in it such right views, such spirit of gentility and propriety, such manly sentiment and conduct, as cannot fail to promote to best conditions of our high civilization at the University. Such men deserve a monument.

DR. J. S. BLACKWELL APPOINTED CHAIRMAN OF FACULTY.

Pending the sickness of Dr. Fisher it became necessary to provide another Chairman of the Faculty. Accordingly, on the 28th day of January, 1891, Dr. J. S. Blackwell, professor of Hebrew and Semitic Literature and Modern Languages, was elected to the position, and has discharged its arduous duties with such ability, fine management and success as to deserve the highest commendation from the Board of Curators, and again to justify the statement that the University owes much to her able corps of professors.

SCIENCE AS TAUGHT IN THE UNIVERSITY.

In the acquisition of knowledge, the greatest danger to youth is that it may be diverted to wrong views of life by false conception of science or a misapplication of its facts. It therefore needs a true friend, a wise counselor, an honest, sincere instructor. To youth, nature is the first and chief revelation. All its phenomena of light, heat, sound, air, substance, form, color, growth, combination, analysis, motion, change and death, by their strange mystery and beauty tend strongly to excite in the mind a feeling of reverence and a sentiment of devotion. It is the voice of nature, the spirit of natural religion inspiring the heart to love and admiration of what is good and worthy. It is a forcible element in good conduct and human happiness; it supports society and strengthens government. To open these truths with

irreverent comment or break their spell on the heart, is sacrilegious. In the lecture and work-rooms of the University nature is unfolded systematically and truthfully, with care that each fact is allied properly to the principle that controls it. Science is taught as a grand system of truth, free from pedantry and without the taint of levity. Its facts are planted in the mind in their true relation and encouraged to develop into right views of nature and life and the correspondence of human happiness to human conduct. When this is done the whole duty of the teachers is met, and this we know is the aim and end of University instruction. And no one can truthfully say that in our halls of science any safeguard of the moral character or spiritual constitution of the student is neglected.

YOUNG MEN'S CHRISTIAN ASSOCIATION.

During the year 1890 a Young Men's Christian Association was permanently organized in the University. It now has 150 members and is rapidly increasing. It belongs alone to the University. It has no outside ministerial or religious connection or aid. It sprang from a common necessity and impulse among the students. No institution of equal force has ever existed in the University to preserve moral influence and enforce the teachings of home. Bible instruction is no part of University or common-school class work. But the students have done voluntarily for themselves what our laws could not do: have brought the direct practical Bible influence into their college life. It is thus made more effective and fruitful of good than Sunday school work or even pulpit instruction to them. They get at once both the benefit of Christian principle and practice. No one is forced to attend the meetings; no one is constrained by college discipline. Yet, being free to all and sought by many, its charm and wholesome presence are noticeable in every department. The constitutional separation of church and state, of public school and sectarian dogma, is right. It is fundamental in our system. But Christianity strikes deeper than written constitutions and flourishes without legal aid. The United States is a Christian country. Missouri is a Christian State. And while her laws do not permit the Bible as a text-book in the University, still her free and Christian spirit does encourage her children to make it their companion and guide. An education that does not lead to reverence for God is injurious to the individual and unsafe to the state. For this reason the Board of Curators, at the request of the association, assigned to them a hall in the University building for their meetings. But the numbers have so increased that a larger hall is now necessary, and the students have undertaken the enterprise of building a hall specially for

their use. They have already raised among themselves about \$6,000, and contemplate raising \$40,000. Is not this a noble spirit and grand undertaking for a body of college students? The University is under high moral influence. All its belongings are promotive of the formation of right character. There is no educational institution in the United States where young men are more secure from evil influences. Our students are a body of moral, manly, self-respecting men who are intent neither on folly nor pleasure, but striving to prepare themselves for the stern duties of life. And their professors and the Board of Curators are giving them every aid possible in their work and hopes.

ELECTION OF PRESIDENT.

On the 18th day of December, 1890, the Board of Curators by unanimous vote elected Prof. Richard H. Jesse President of the University, from and after the 1st of July, 1891. He was duly notified and has accepted. By direction of the Board he will be inaugurated at the chapel in the University on the 3d day of June, 1891. The occasion will be one of great interest to all, and we think a singular good fortune to the University. President Jesse is a ripe scholar, having enjoyed the highest advantages the best colleges of the United States could bestow, to which he has added the opportunities of foreign travel. He gained wide experience in the organization and building up of Tulane University. President Jesse is a man of broad views, of excellent judgment of men, fine common sense and tact in the management of business. He possesses special executive ability. He is indorsed to us by men of eminent character and by great scholars and educators, whose critical judgment cannot be questioned. All indications of the success of the incoming administration are very favorable indeed.

ENDOWMENT.

If any person has doubted the favorable sentiment of the people of Missouri toward the University, he certainly must be convinced by the action of the Thirty-sixth General Assembly endowing it. Previous to that time it had an endowment fund of its own of \$222,000. The Agricultural College had an endowment of \$312,000. The Thirty-sixth General Assembly added to this the munificent fund of \$646,946.23, making a total endowment of the University and all its departments of \$1,180,946.23. It is true that the honor of originating the endowment proposition belongs to your Excellency. You first conceived the idea of setting apart the money derived under the congressional direct tax refunding act to this grand purpose, and on the 6th day of March, 1891, sent to the Legislature your special message recommending the measure.

It will always be a bright page in the history of your administration. But the General Assembly most patriotically approved the measure, and enacted it into law. It is no doubt the wisest and most beneficent act in the history of our State for many years. Its influence upon education will be great and permanent. Its moral will even exceed the material effect upon the University. It is well known to what extent the biennial recurring agitation as to the University in the Legislature has injured it. Henceforth it will be free from this misfortune. It is not, however, self-sustaining, and will need legislative aid (but it will be comparatively small) for support and maintenance. Of course, no part of the endowment, or the interest, can be used in the erection of buildings, of which several are now very much needed.

BUILDINGS NEEDED.

The public buildings most urgently needed are a chemical laboratory, a medical building, a gymnasium, another club building and an agricultural and mechanical college building. These matters will, however, be more properly presented to the Thirty-seventh General Assembly for action, and are only mentioned here because required by statute.

PREPARATORY COURSE.

It is objected that the University does preparatory work. But this is not of choice: it is required by statute. In 1889 the Board of Curators, on petition of the Alumni Association, considered this matter, and not being able to wholly abolish the preparatory feature, did nevertheless raise the standard of admission to the highest degree possible not to violate the law. In this way many preparatory students who applied for admission were denied. We could do no more. But we think the law should be so amended as to relieve the University of preparatory work altogether. For while it is limited, still it gives opportunity for illiberal criticism, and tends to cloud the character of the University for the highest standing. The University is doing true university work. Its requirements for graduation are ample. Its course is fixed along the lines of higher education. Its diploma is a passport to any college in the United States or Europe. Under the liberal support extended to it by the State, it has no necessity to undertake preparatory work or to perpetuate a competition with high schools and academies in even the least degree.

ARTICULATION.

It is equally evident that the University is too much isolated from the lower schools. It seems to stand alone in the State. Constitutionally and legally, it is a part of the school system, but in fact it is unsup-

ported by the system. There is no organic influence impelling public attention or even encouraging public patronage. The public schools receive support from an endowment equal to ten million dollars. Yet they are legal strangers to the University. There is a great chasm between them. There is no circulation from one to another. Both are individually well organized, but they are too far apart. Bring them together. How? By a legal bond. Make them legally serviceable to one another. Every public school should be put under legal gravitation to the University. Every public teacher should be constituted a missionary for higher education. The high school and normal schools should all find their places in the common system. The entire institute system as now constituted—county, district and state—should be arranged to minister to the “highest organ of the State’s intellectual life.” On the other hand, the various departments of the University should be set in motion, and by law compelled to shed their light and powerful influence among the other schools. Thus brought together, organized and vitalized, the whole would prove co operative, self-supporting and self-stimulating.

REORGANIZATION OF THE AGRICULTURAL AND MECHANICAL COLLEGE

The Board of Curators have felt a deep concern for the Agricultural College as a department of the University. We have labored during the last two years most earnestly to secure to it that attractiveness, power and usefulness commensurate with the farming and mechanical interests of the State, and suitable to a just expectation. “One of the great demands of the present day is the practical education and training of the industrial classes in the lines of their ordinary pursuits and vocations.” To this end our efforts have been given. And while they have been satisfactory neither to ourselves nor the public, it should in justice to the situation be remembered how great were the difficulties heretofore. And it should be remembered that the State cannot claim to have done its whole duty in the premises. By act of February 4, 1870, of the Legislature, the Agricultural and Mechanical College was made a department of the University, with a large landed endowment, but practically with no income. The University for years had to carry it as best it could out of its own funds. No special provision was made for it by the State, as it was bound to do by the acceptance of the land grant of July 2, 1862. It was many years before a sufficiency of the lands could be sold to yield an income of any great benefit. Only recently has the Department attained to an income from interest on proceeds of sale of its lands of less than

\$12,000. With this, while much has been accomplished, it is not what is due to or expected by the farming and mechanical classes.

But under the Congressional act of August 30, 1890, the annual income is now large enough to permit more ample work, and accordingly the Agricultural and Mechanical department has been recently reorganized on a broader basis, with the most effective arrangements possible under the circumstances. The last Legislature failed to appropriate anything whatever for the department for greatly needed buildings and facilities, or for the improvement of the farm. Nevertheless, it is expected that the ensuing year will prove one of great practical advancement in this department of theoretical and practical instruction.

For further information on this matter, special attention is called to the report of Dr. E. D. Porter, Dean of the Agricultural college and Director of the Experiment station. It will be there seen that the mechanical or manual training is a prominent feature in the system. And it is expected in the near future, when the State shall have provided the proper facilities and buildings, that practical training in the actual industries of life will be one of the greatest interests of the University; and that young men will go out, not only thoroughly trained intellectually, but with ability to enter into immediate profitable business, with the eye and the hand trained and accustomed to turn into immediate self-support and profit the thoughts and activities of the thoroughly equipped brain power. By this reorganization we believe that we have vitalized this department, and made it worthy of the public confidence and support.

Respectfully submitted.

G. F. ROTHWELL,
President of the Board of Curators.

CORPORATION.

THE BOARD OF CURATORS.

GEN. E. Y. MITCHELL.....	Rolla.....	} Term expires Jan. 1, 1893.
HON. R. B. OLIVER	Jackson.....	
HON. JOHN S. CLARKSON.....	Columbia....	
HON. B. M. DILLEY.....	Hamilton....	} Term expires Jan. 1, 1895.
HON. GARDINER LATHROP.....	Kansas City..	
HON. B. R. CAUTHORN.....	Mexico.....	
HON. J. R. RIPPEY.....	Glenwood....	} Term expires Jan. 1, 1897.
HON. G. F. ROTHWELL.....	Moberly.....	
PROF. C. M. WOODWARD.....	St. Louis....	

OFFICERS OF THE BOARD.

HON. G. F. ROTHWELL.....	President.
HON. B. M. DILLEY.....	Vice-President.
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Secretary.	Treasurer.

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JOSEPH E. CAMPBELL, Esq.....	Rolla.
JOHN W. LIVESAY, Esq.....	Rolla.
T. M. JONES,	D. W. MALCOLM,
Secretary.	Treasurer (office at Rolla).

BOARD OF VISITORS.

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HON. NORMAN J. COLMAN.....	St. Louis....
HON. JOHN F. WILLIAMS.....	Macon.....
HON. F. F. ROZZELLE.....	Kansas City..
HON. G. B. ROLLINS	Columbia....

THE UNIVERSITY FACULTY.

Excepting that of the Chairman of the Faculty, the names are printed in their chronological order of appointment.)

* M. M. FISHER, D. D., LL. D.,
Chairman of Faculty, and Professor of Latin Language and Literature.

† JAMES SHANNON BLACKWELL, A. M., PH. D.,
Chairman of Faculty.

JOSEPH G. NORWOOD, M. D., LL. D.,
Emeritus Professor of Physics.

PAUL SHWEITZER, PH. D.,
Professor of Chemistry.

ANDREW W. MCALESTER, A. M., M. D.,
Professor of Surgery and Diseases of Women and Children.

Judge SEYMOUR D. THOMPSON, LL. D.,
Lecturer on the Law of Corporations.

THOMAS JEFFERSON LOWRY, S. M., C. E.,
Professor of Civil Engineering and Dean of Engineering Faculty.

WOODSON MOSS, M. D.,
Professor of Anatomy and Physiology and Secretary Medical Faculty.

JAMES SHANNON BLACKWELL, A. M., PH. D.,
Professor of Hebrew and Semitic Literature and Modern Languages.

Professor of Art.

CHRISTOPHER G. TIEDEMAN, A. M., LL. B.,
Resident Professor of Law.

W. C. TINDALL, M. S.,
Associate Professor of Mathematics.

* Died February 20, 1891.

† Since January 26, 1891.

J. C. JONES, A. M.,
Professor of Comparative Philology and Associate in Latin.

*E. A. DRAKE, M. A., (M. S.),
Instructor in Academic Department.

PAUL PAQUIN, M. D., V. M.,
*Professor of Comparative Medicine and Veterinary Science, and Director of University
 Pathological Laboratory.*

EDWARD A. ALLEN, LITT. D.,
Professor of English and Dean of Normal Faculty.

WM. B. SMITH, PH. D. (Goett.),
Professor of Mathematics.

CLARENCE L. SPEYERS, PH. B.,
Assistant in Chemistry.

W. W. CLENDENIN, S. M.,
Assistant Professor of Geology and Mineralogy.

H. C. PENN, A. B.,
Assistant Professor of English.

GEORGE D. PURINTON, A. M., M. D., PH. D.,
Professor of Biology and Director and Curator of the Museum.

G. C. BROADHEAD, M. S.,
Professor of Geology and Mineralogy.

JAMES A. YANTIS, LL. B.,
Resident Professor of Law.

BENJAMIN F. HOFFMAN, L. M.,
Assistant Professor of Modern Languages.

MRS. JOHN P. ROYALL,
Principal of Ladies' Department.

*W. H. ECHOLS, B. Sc., C. E. (M. S.),
Director and Chairman of the Faculty.

*E. A. DRAKE, A. M. (M. S.),
Instructor of English.

*P. J. WILKINS, B. S., (M. S.),
Instructor in Preparatory Department.

JOHN P. ROYALL,
Professor of Book-keeping.

*Mining School.

J. W. CLARK, B. S.,
Professor of Horticulture and Superintendent of Horticultural Grounds.

M. L. LIPSCOMB, A. M.,
Professor of Physics.

* W. B. RICHARDS, M. A. (M. S.),
Professor of Mathematics.

Lieutenant B. B. BUCK,
 (Detailed from the Regular Army)
Professor of Military Science and Tactics.

EDWARD D. PORTER, M. A., PH. D.,
Professor of Agriculture and Dean of the Agricultural College.

HIRAM PHILLIPS, TOP'L ENGINEER,
Assistant Professor of Engineering.

A. L. McRAE, SC. D.,
Assistant Professor Physics.

SILAS DINSMOOR,
Assistant in Chemistry.

W. R. DODSON, S. B.,
Assistant in Biology.

ALEXANDER MARTIN, A. M., LL. D.,
Professor of Law and Dean of the Law Faculty.

* GEORGE R. DEAN, C. E. (M. S.),
Instructor in Mathematics and Physics.

* CHASE PALMER, PH. D. (M. S.),
Professor of Analytic Chemistry and Metallurgy.

* ARTHUR J. STEWART, B. SC. (M. S.),
Instructor in Analytic Chemistry and Metallurgy.

J. W. MONSER,
Librarian.

J. G. BABB,
Proctor.

W. G. MANLY, U. VA., A. M. (HARV.),
Professor of Greek Language and Literature.

MILTON UPDEGRAFF, M. S., B. C. E.,
Assistant Professor of Mathematics and Astronomy, and Director of the Observatory.

MRS. W. T. LENOIR,
Instructor in Physiology and Hygiene in Ladies' Department.

STUDENTS

UNDER-GRADUATES.

ACADEMIC STUDENTS.

POST-GRADUATES.

Name.	Residence
Fisher, Samuel Blair.....	Boone county
Hancock, Miss Gay	Chariton county

SENIOR CLASS.

Name.	Residence.
Britt, Miss Leila	Cass county
Divelbiss, Frank P.	Ray "
Dorman, John B.	Henry "
Gentry, Richard W.	Boone "
Gray, Louis N. B.	Moniteau county.....
Hatton, John H.	Van Buren county, Iowa...
Ingrum, Robt. P.	Cass county
Jennings, William S.	Lawrence county
McLeary, Henry S.	Cape Girardeau county....
Paxton, Joseph F.	Lincoln county
Pratt, Geo. C.	Boone "
Russell, Joseph L.	Moniteau "

JUNIOR CLASS.

Name.	Residence.
Adams, Newton T.	Shelby county
Beach, Emory V.	Lewis & Clarke, Montana...
Bonfils, Charles A.	Marion county.....
Bronson, Harl H.	Pettis "
Brown, George L.	Bates "
Caldwell, Robert	DeKalb "
Conley, Milton R.	Boone "
Denny, James M.	Howard "
Dent, Louis Lee.	Dent "
Dinsmoor, Gordon	Adair "
Fellows, John W.	Platte "
Fisher, Miss Jennie M.	Schuylar "
Gerling, Henry J.	Boone "
Goodrich, James E.	Clinton "
Groves, Hiram J.	Lafayette "
Hancock, Miss Alice V.	Chariton "
Hanszen, Miss Lydia.....	Cole "
Howell, Charles M.	Atchison "
Keyser, Cassius J.	Ohio.....

JUNIOR CLASS—Continued.

Name.	Residence.
Knox, Willis.....	Cape Girardeau county.....
LaMotte, John H.....	Howard county.....
Lockwood, Marquis H.....	Atchison ".....
Lynch, Samuel A.....	Illinois.....
Mansfield, Miss May.....	St. Louis.....
Martin, Leonidas W.....	Marion county.....
Moore, Harris L.....	Colorado.....
Osborn, Ollie S.....	Clinton county.....
Ray, Frank O.....	Kansas City.....
Ruark, Robert O.....	Lawrence county.....
Sams, Wm. M.....	Jackson ".....
Selsor, Mark A.....	Davies ".....
Woodruff, Frederick E.....	St. Louis.....

SOPHOMORE CLASS.

Name.	Residence.
Adams, Miss Jennie.....	Shelby county.....
Adams, Miss Vinnie.....	Boone ".....
Allen, Edward Thorpe.....	Nodaway ".....
Anthony, Francis R.....	Holt ".....
Asendorf, George W. H.....	Boone ".....
Banks, Miss Anna.....	" ".....
Banks, W. M.....	Moniteau ".....
Bishop, J. E.....	Chariton ".....
Burlington, Sam'l A.....	Vernon county.....
Burkhart, L. H.....	Andrew ".....
Clack, James M.....	Boone ".....
Debord, King.....	" ".....
Donnohue, Miss Mary L.....	Bollinger ".....
Downing, Robt E.....	Franklin ".....
Drum, John W.....	Arkansas.....
Eitzen, Miss Cora A.....	Kansas City.....
Fannin, Frederick H.....	Boone county.....
Frey, George G.....	Montgomery ".....
Gerig, Miss Ida.....	St. Louis.....
Graham, Benjamin R.....	Boone county.....
Granger, Orrin W.....	Boone ".....
Haines, Charles G.....	Iowa.....
Harris, Hermann F.....	Marion county.....
Hatton, Moses W.....	Rav.....
Holmes, Albert S.....	Chariton ".....
Morton, James P.....	Marion ".....
Myer, Jesse.....	Macon ".....
Schmidt, Miss Emily R.....	Linn ".....
Scrutchfield, Guthrie E.....	St. Louis.....
Spalding, Elliott.....	Boone county.....
Taylor, Thomas J.....	Boone ".....
Todd, Elhanan H.....	Boone ".....
Todd, Iva J.....	Boone ".....
Turner, Edwin.....	Dent ".....
Vaughan, Robt. E. Lee.....	Nodaway ".....
Walker, Harry B.....	Montgomery ".....
Weltner, Franklin B.....	Boone ".....
Westlake, Miss Ruby M.....	Boone ".....
Westlake, Miss Nancy P.....	Boone ".....
White, James P.....	Howard ".....
Williams, Henry C.....	Andrew ".....
Zey, Edward G.....	Henry ".....

FRESHMAN CLASS.

Name.	Residence.
Adams, Andrew Vance.....	Bates county.....
Anderson, Mark McC.....	Boone ".....
Arnold, John B.....	Audrain ".....
Atterbury, Eugene.....	Monroe ".....
Banks, J. S.....	Boone ".....
Barbour, Miss Lizzie M.....	San Antonio, Texas.....
Barnett, Miss Beulah H.....	Boone county.....
Barnett, Miss Mary J.....	Boone ".....

FRESHMAN CLASS—Continued.

Name.	Residence.
Beasley, G. H.	Boone county
Belden, Wm. E.	Boone "
Billups, W. E.	Van Buren county, Iowa
Blair, Ivan Leo.	Holt county
Bodine, Cooper P.	Shelby "
Bradley, Nicholas M.	Johnson "
Broadhead, Garland C.	Boone "
Brown, George G.	Marion "
Burk, Miss Bessie B.	Randolph "
Burney, Robt. H.	Johnson "
Campbell, W. T.	Jackson "
Campbell, Miss Harriet.	Boone "
Cauthorn, Edward B.	Boone "
Chambers, Albert S.	Clay "
Chapman, Sumner F.	Ellis county, Texas
Childs, Raymond B.	Bates county
Coleman, George W.	Platte "
Cooper, James W.	Indian Territory
Crumbaugh, Miss L. C.	Boone county
Daniel, Robert B.	Cass "
Davis, Henry F.	Marion "
Davidson, Everett J.	Miller "
Dawes, Hamilton M.	Saline "
Dent, W. J.	Washington "
Dodson, Allen E.	Boone "
Duncan, Jesse J.	Lincoln "
Dunn, John J.	Davless "
Eaton, Alfred W.	Clinton "
Eby, Willard C.	Johnson "
Elkin, Asa B.	Boone "
Ellis, William A.	Pike "
Ficklin, Thos. A.	Boone "
Fisher, Burr	Polk "
Flood, Miss Elizabeth B.	Linn "
Fyfer, John K.	Boone "
Garrett, Joseph P.	Holt "
Gary, John A.	Mississippi
Gordon, W. E.	Nodaway county
Goslin, Benjamin F.	Boone "
Graves, Miss Lydia C.	Boone "
Guyer, Mack F.	Clinton "
Haigler, Harry L.	Holt "
Hack, Miss Mamie B.	Boone "
Hamacher, Elmer R.	Ray "
Hancock, Miss Mary	Chariton "
Haydon, Curtis	Boone "
Haydon, Hollis	Boone "
Hays, Chas. T.	Ralls "
Hedrick, Ira G.	Livingsgton "
Hil, Curtis	Jackson "
Hockaday, Charles E.	Cass "
Hoffmann, Gustavus A.	Gasconade "
Immer, George C.	Henry "
Jackson, Miss Clarissa.	Boone "
Jewett, Howell H.	Shelby "
Keyser, Mrs. Ella M.	Ohio
Kiehl, Hermann G.	Franklin county
Litton, Charles H.	Vernon "
Loeb, Clarence	Boone "
May, Henry A.	Franklin "
May, David W.	Johnson "
McCulloch, Albert J.	Cooper "
McCurdy, George V.	Pettis "
Miller, Miss Olga.	Shelby "
Mitchell, Homer R.	Boone "
Moore, William B.	Macon "
Murry, Jerre H.	Callaway "
Myers, Miss Hattie E.	Shelby "
Nixon, Alexander.	Holt "
Park, Allen	Boone "
Peeler, William B.	Howard "
Pettengill, Miss Minnie A.	Boone "
Quinn, Abram T.	Boone "
Reneau, Arthur C.	Pike "
Riggs, Miss Inez L.	Pike "
Riggs, Norman C.	Pike "
Roe, Samuel A.	Boone "
Rouse, Harry S.	Lewis "
Sears, Miss Eleanor P.	Morgan "
Shaefer, Miss Jean A.	Boone "
Shawhan, Daniel L.	Joackson "
Smith, Miss Elra Deans	Washington

FRESHMAN CLASS—Continued.

Name.	Residence.
Smith, George	Linn county
Stephens, Miss Mary L.	Boone "
Stone, Kimbrough	Vernon "
Terrill, Miss Lizzie E.	Randolph "
Terrill, Vincent C.	Randolph "
Terrill, Henry R.	Randolph "
Titus, Frank	Ray "
Toalson, Omer A.	Henry "
Todd, Benjamin C.	Boone "
Truitt, Clarence	Boone "
Vallier, James	Shelby "
Yowell, Benjamin J.	Boone "

PREPARATORY CLASS.

Name.	Residence.
Allen, Charles W.	Nodaway county
Almstedt, Hermann B.	St Charles "
Andrae, William John	St. Louis "
Bain, Claud	Grundy "
Balthis, Frank S.	Randolph "
Ball, James M.	Lewis "
Barnett, Sentiny	Boone "
Barnett, G. H.	Boone "
Bautzer, Edward H.	Osage "
Bear, Alfred S.	Moniteau "
Beasley, Miss Irene B.	Boone "
Biggs, Lon A.	Greene "
Bishop, Charles E.	Nodaway "
Blackwell, William A.	St. Louis "
Blake, William S.	St. Louis
Bogie, Rector S.	Ray county
Boisseau, Oscar G.	Johnson "
Bosier, W. H.	Howard "
Boyer, John S.	Buchanan "
Bradford, Alexander	Boone "
Brasfield, James E.	Cass "
Bretz, William Shull	Boone "
Brown, Finis A.	St. Clair "
Brown, Miss Emma M.	Boone "
Carter, Miss Sallie E.	Audrain "
Carter, James Milton	Audrain "
Caskie, John J. K.	St. Louis
Clayton, Charles A.	Greene county
Conley, Miss Minnie	Boone "
Conley, W. T.	Boone "
Conley, Miss Rosa B.	Boone "
Corder, George	Lafayette "
Cottingham, Ernest	Randolph "
Danforth, Henry A.	Mississippi "
Davis, George T.	Vernon "
Davis, Frank	Ralls "
Diffenderfer, Harry W.	Laclede "
Diven, Thomas H.	Boone "
Edmonds, Miss Mary A. L.	Boone "
Edwards, Granville D.	Caldwell "
Eppes, Thomas J.	Boone "
Faris, John C.	Boone "
Felker, Henry C.	Maries "
Ficklin, Walter H.	Boone "
Fisher, Robert E.	Macon "
Garrett, Corydon	Pemiscot "
Gilhausen, John P.	Clark "
Grace, Charles H.	Livingston "
Granger, Clyde E.	St. Louis
Griggs, Austin B.	Knox county
Grossman, Roy	Boone "
Guitar, Odon	Boone "
Harrison, Miss Grace	Harrison "
Harrison, Miss Cora	Harrison "
Hatcher, Maurice S.	New Madrid "
Hartley, Robert Lee	Cedar "
Hays, Jesse T.	Cooper "
Heaston, George W.	Harrison "
Heisserer, Michael A.	Scott "
Hermann, Burr	Kansas

PREPARATORY CLASS—Continued.

Name.	Residence.
Hewett, John.....	Boone county.....
Hill, Frank W.....	Chariton ".....
Hill, George W.....	Boone ".....
Holman, J. Hubert.....	Putnam ".....
Immer, Godfrey H.....	Henry ".....
Jacob, Willard W.....	Boone ".....
Johnson, Edward R.....	St. Louis.....
Jones, Elmer R.....	Jasper county.....
Keener, Frederick D.....	DeKalb ".....
Kenner, George D.....	Jefferson ".....
Kleinsarge, William F.....	Franklin ".....
Knox, John U.....	Montgomery ".....
Locker, George E.....	Barton ".....
Lockridge, Miss Bertha D.....	Linn ".....
Mahan, Miss Alameda.....	Boone ".....
Manring, John F.....	Gentry ".....
Marshall, William N.....	Putnam ".....
Martin, Otis T.....	Laclede ".....
Mason, William E.....	Gentry ".....
Mayer, Daniel Lee.....	Boone ".....
McAlester, Andrew W.....	Boone ".....
McBurney, Grier.....	Grundy ".....
McGauhey, Archibald.....	Buchanan ".....
Mikel, Henry F.....	Boone ".....
Miller, George E.....	St. Charles ".....
Miller, Miss Mary E.....	Shelby ".....
Moore, Greeley.....	Linn ".....
Morgan, John W.....	Virginia.....
Napton, John B.....	Cass county.....
Nelson, George A.....	Buchanan ".....
Niedermeyer, Frederick W.....	St. Louis.....
O'Toole, Charles T.....	Vernon county.....
Parmer, John E.....	Boone ".....
Powell, Miss Bessie.....	Boone ".....
Pratt, Charles W.....	Boone ".....
Pratt, John K.....	Boone ".....
Prince, Ruby A.....	Boone ".....
Purcell, Reuben D.....	Audrain ".....
Reed, Orson D.....	Monroe ".....
Rees, Miss Minnie.....	Boone ".....
Rench, John A.....	Scotland ".....
Roberts, Rube K.....	Boone ".....
Robinson, Clark.....	Boone ".....
Rowell, Joseph.....	Clay ".....
Rush, James O.....	Johnson ".....
Russell, Ernest H.....	Monteau ".....
Schnecks, Robert.....	St. Louis ".....
Slaughter, James A.....	Knox ".....
Sloan, Thomas W.....	Dade ".....
Smith, Joseph E.....	Washington State.....
Smith, Miss Camill M.....	Boone county.....
Smoot, John D.....	Schuyler ".....
Sparks, Fred L.....	Shelby ".....
Stull, Josiah H.....	Morgan ".....
Stull, Thomas G.....	Morgan ".....
Sturgis, Fred.....	Caldwell ".....
Suggett, Manlius P.....	Saline ".....
Switzler, Clifford T.....	Boone ".....
Teeter, George D.....	Bates ".....
Terrill, Miss Anna C.....	Randolph ".....
Thomas, Emile.....	St. Louis.....
Thompson, Benjamin.....	Warren county.....
Thompson, Thomas W.....	Warren ".....
Timberlake, Estill M.....	Boone ".....
Turner, Miss Cora B.....	Boone ".....
Veach, Samuel J.....	Barry ".....
Via, Miss Willah M.....	Boone ".....
Vivion, James G.....	Colorado.....
Wade, Sydney J.....	Scott county.....
Weatherford, Guy.....	Putnam ".....
Wentworth, Orris F.....	Putnam ".....
Wickham, Frank D.....	Cole ".....
Wilson, Guy.....	Boone ".....
Wylie, Charles M.....	Scott ".....
Zarn, George G.....	Platte ".....

SPECIAL STUDENTS.

Name.	Residence.
Allen, James M.	Barton county
Bickel, James F.	Grundy "
Bostic, John L.	Clark "
Dorsett, P. H.	Boone "
Fish, Reuben W.	
Hise, Sherman R.	Gentry county
Kiehl, Gottlieb H.	Franklin county
Nordfleet, Abraham L.	Moniteau "
Sears, Alonzo J.	" "

AGRICULTURAL STUDENTS.

Name.	Residence.
Conner, C. M.	Boone county
Davis, Forrest E.	Vernon "
Davis, Henry L.	Lawrence county
Hickman, Thomas H.	Boone county
Hickman, Thaddeus B.	" "
McGuire, Marius S.	" "

NORMAL STUDENTS.

Name.	Residence.
Beasley, Edgar F.	Boone county
Broadhead, Miss Rosalie.	St. Louis county
Burnham, Miss Nannie	Boone "
Burton, Miss Lizzie	Randolph "
Butcher, Miss Laura E.	Boone "
Conner, James E.	" "
Conran, James F.	Montgomery county
Cox, Samuel S.	" "
Davis, H. L.	Lawrence "
Davis, Henry.	Shelby "
Dillon, John W. S.	Worth "
Floyd, Monroe A.	Saline "
Grempp, William A. Von.	Maries "
Harris, Miss Susan D.	Callaway "
Holloway, Miss Dollie B.	Boone "
Johnson, Miss Annie.	Illinois
Longwith, John W.	Greene county
Lynch, Miss Dora A.	Illinois
McAdow, Albert T.	Vernon county
McClement, Miss Belle.	Bates "
McGhee, Miss Lillian S.	Boone "
McQuitty, James W.	" "
Oliver, Miss Lizzie.	" "
Oliver, Miss Mary M.	" "
Riggs, Miss Mary	" "
Schweitzer, Miss Lizzie	" "
Settle, Miss Evia.	Shelby "
Sinclair, Miss Margaret.	Boone "
Stemmons, Miss Mattie A.	Barton "
Stephens, Peyton	Boone "
Stewart, Miss Florence	" "
Tebbs, Miss Mary P.	Platte "
Thurman, Anderson W.	Bates "
Trumbo, Charles E.	Linn "
Waide, John F.	Andrew "
Waugh, Miss Roberta	Chariton "
Weakley, Floyd L.	Clinton "
Whittenburg, Will. W.	Shelby "
Williams, David E.	Laclede "
Williams, Frank	Boone "

LAW STUDENTS.

Name.	Residence.
Allen, James M.	Barton county
Arnold, James D.	Boone "
Barnett, James S.	Boone "
Beach, Alva W.	Montana
Biggs, George R.	Pike county
Blake, Frank	Kansas City
Blogie, Mordecai M.	Ray county
Burk, James S.	Randolph county
Cameron, John F.	Carroll "
Chambers, John R.	St. Louis "
Cheney, George N.	Boone "
Crews, Paul N.	Howard "
C Davis, Harry M.	
Cenny, James H.	Howard county
Cunklin, Robert R.	Sullivan
Edwards, George L.	Cole "
Evans, Lindell P.	Boone "
Farley, Robert E.	Boone "
Fardner, Albert E. L.	Pettis "
Ferig, Edward	Boone "
Frempp, Christian C. Von	Maries "
Frwin, James	Saline "
Gerndon, Harry T.	
Ginkle, John I.	Franklin county
Gane, Dennis W.	Texas
Geith, Charles A.	Lafayette county
Gemp, George W.	Montgomery county
Gittell, William R.	Atchison
Gocker, William H.	Barton "
Ganning, Ananias V.	McDonald "
Ganns, Arnold	Pike "
Gayfield, Leander C.	Laclede "
Gayfield, Irvin W.	Laclede "
McCulloch, Robert L.	Cooper "
McWilliams, Homer	Kansas City
Montgomery, Leon K.	Andrew county
Neal, James P.	Arkansas
Donohoe, James J.	St. Louis
Mahoney, Clarence	Boone county
Marker, Warren A.	Audrain county
Mittman, Hubert N.	Arkansas
Mogue, Henry F.	Benton county
Muckett, Oscar	Lafayette "
Mecords, William P.	Jackson "
Robinson, Omar E.	Bates "
M Rodgers, Robert D.	Audrain "
Muark, Horace C.	Newton "
Chaper, Jesse H.	Warren "
Chell, Aytchmonde P.	Buchanan "
Precker, William H.	Crawford "
Minson, Michael P.	Knox
Mirling, Bowman J.	Mississippi
Thomson, Robert G.	Saline county
Thompson, Burton M.	Boone "
Cipton, Joseph C.	Boone "
Warner, William H.	Moniteau "
Coalson, Oscar B.	Henry "
Peerkamp, James P.	Audrain "
Varden, Hubert P.	Virginia
White, Edward J.	Arkansas
Whitsett, George P.	Jasper county
Villis, John S.	Boone "

COMMERCIAL STUDENTS.

Name.	Residence.
Roberts, Miss Susan D.	Randolph county
Vulkinson, Anderson	Boone "
Wright, Miss Mary A.	Boone "

MEDICAL STUDENTS.

Name.	Residence.
Asbury, Brish Brown	Boone county
Asbury, Levi M	Chariton
Bradley, Arthur H.	Henry
Burch, Frank C	Boone
Byrns, Robert W.	Audrain
Cook, Richard F.	Boone
Cox, Walter C.	Montgomery county
Fluesmieir, Elihu A.	St. Charles county
Flynt, Joseph F.	Boone
Fulton, Frank H.	Clay
Hatton, Ossian F.	Boone
Hodge, Frank M.	Boone
Jordan, Joe O.	Howard
Kurtz, Russell L.	Boone
Lockwood, William D.	Atchison
McClane, Norma O.	Boone
Nichols, Robert Lee	Boone
Poague, Samuel A.	Benton
Potts, Charles D.	Boone
Robinson, John F.	Johnson
Shafer, Walter W.	Henry
Thompson, Alonzo C.	Macon
Thornton, Joseph E.	Boone
Treadway, Ollie M.	Pike
Wade, Fernando H.	Boone
West, William D.	Chariton
Williamson, Frank B.	Boone
Wolff, Eugene J.	Henry
Yager, George W.	Boone

ENGINEERING STUDENTS.

Name.	Residence.
Axtell, Oliver Neal	Jackson county
Cauthorn, William B.	Boone
Crecelius, Samuel F.	St. Louis
Ellis, Abram P.	Audrain
Grady, Walter K.	Saline
Haley, John L.	Boone
Hall, William F.	Henry
Hunter, Wilbur C.	Grundy
McKean, Lewis B.	Henry
Nifong, Walter R.	Madison
Shinkle, Samuel W.	Maries
Talbert, Charles M.	Barry

SUMMARY.

Academic Students—		Professional Students—	
Post graduates	2	Agricultural	4
Seniors	12	Normal	6
Juniors	32	Law	2
Sophomores	42	Medical	1
Freshmen	102	Engineering	
Preparatory	135	Commercial	
Special	9		
Total	334	Total	15
		Grand total	48
		Names counted twice	
		Number of individual students	48

STUDENTS OF SCHOOL OF MINES AND METALLURGY.

Name.	Residence.
Alexander, Thompson	Fort Smith, Ark.
Anderson, R. E.	Phelps county
Archer, F. C.	Phelps
Bowles, Chas.	Phelps
Bradford, H.	Texas
Baskett, E. W.	Phelps
Baskett, Mary	Phelps
Baskett, Nancy	Phelps
Campbell, Catharine	Phelps
Campster, Augusta	Phelps
Case, A. B.	Dent
Clark, G. C.	Greene
Cornnut, A. J.	New York
Cornwall, H.	St. Louis
Dean, Geo. R.	Waterloo, Ill.
Deegan, Agnes	Phelps county
Donahoe, Maymie	Phelps
Duncan, F. E.	Phelps
Dwyer, E. P.	Jasper
Dyer, Temple	Phelps
Dulkner, M. F.	Phelps
Eet, W. A.	Dent
Eorreich, Phillip	St. Louis
Fort, Nellie	Phelps county
Fox, Homer	St. Louis
Fove, C. D.	Davies county
Geller, Sam'l.	Phelps
Gellmuth, G. W.	Phelps
Genderson, H. P.	Phelps
Gerdman, Geo.	Neosho Falls, Kas.
Gime, A. P.	Washington, D. C.
Gatson, W. E.	Orlando, Fla.
Gelman, W. P.	Dent county
Gekling, D. C.	Pettis
Gekson, J. M.	New Mexico
Gimison, Blanche	Phelps county
Gimison, E. M.	Phelps
Gimison, W. A.	St. Louis
Gines, F. A.	Jackson county
Gines, H. I.	St. Louis
Gilly, C. M.	Johnson county
Giehn, E.	Lafayette
Gewis, H. E.	St. Louis
Gewe, P. L.	Jackson county
Ginsbridge, Elizabeth	Phelps
GAfee, C. B.	Greene
GAfee, J. R.	Greene
GCarr, E.	Phelps
GCarr, Maggie	Phelps
Glard, Linna	Phelps
Glard, Mary	Phelps
Glard, Sallie	Phelps
Gtchell, Maude	Phelps
Gorgan, Minnie	Phelps
Gorris, Lola	Phelps
Gorrow, S. L.	Fort Smith, Ark.
Gurray, M. B.	Christian county
Gadigan, Fannie	Phelps
Gwer, John	Wichita, Kas.
Gid, John	Pleasanton, Kas.
Ghardson, Ethelyn	Phelps county
Gppenfield, Estella	Phelps
Gppenfield, Olive	Phelps
Ghmook, Otto	Greene

SCHOOL OF MINES—Continued.

Name.	Residence.
Schweitzer, Geo.....	St. Louis.....
Seamon, F. H.....	Wheeling, West Va.....
Shinneman, L.....	Phelps county.....
Simmonds, A. G.....	Greenville, N. J.....
Southgate, Maggie.....	Phelps county.....
Spencer, C. B.....	Jasper ".....
Stewart, A. J.....	Victoria, New Mexico.....
Strine, A. T.....	Phelps county.....
Strobach, Minnie.....	Phelps ".....
Sutter, H. M.....	Greene ".....
Thomas, W. S.....	Macon ".....
Tyrrell, R. L.....	Dent ".....
Wade, A.....	Montana.....
Wipperr, C. A.....	St. Louis.....
Wood, Minerva.....	Phelps county.....
Young, Marshall.....	St. Louis.....

SUMMARY.

Counties.

Christian.....	1	Marion.....	1
Daviess.....	1	Pettis.....	1
Dent.....	4	Phelps.....	37
Greene.....	5	St. Louis.....	9
Jackson.....	2	Texas.....	1
Jasper.....	2	Total.....	66
Johnson.....	1		
Lafayette.....	1		

States.

Arkansas.....	2	New Mexico.....	2
Florida.....	1	New York.....	1
Illinois.....	1	West Virginia.....	1
Kansas.....	3	Washington, D. C.....	1
Missouri.....	66	Total.....	80
Montana.....	1		
New Jersey.....	1		

SUMMARIES.

1. Academic Schools.

a. Language.	No. of Students.	b. Science.	No. of Students.
1. English.....	341	1. Metaphysics.....	20
2. Latin.....	295	2. Mathematics.....	357
3. Greek.....	66	3. Physics.....	267
4. Modern Languages.....	155	4. Chemistry.....	342
5. Hebrew.....	23	5. Geology and Mineralogy.....	154
6. Sanskrit.....	5	6. Biology.....	233
7. Comparative Philology.....	14		

2. Professional Schools.

	No. of Students.		No. of Students.
1. Agriculture.....	6	6. Engineering.....	55
2. Normal.....	40	7. Military Science and Tactics.....	175
3. Law.....	65	8. Drawing.....	62
4. Medicine.....	35	9. Commercial.....	
5. Mining School at Rolla.....	80		

STUDENTS AND GRADUATES.

Academic Students and Graduates of the University from 1843 to 1891, inclusive.

Years.	No. of students at Columbia....	Academic Graduates.					No. of students at Rolla.....
		A. B.....	S. B.....	Ph. B.....	L. B.....	A. D. B....	
1843.....	78	2	...	...	...	...	...
1844.....	80	4	...	...	...	...	...
1845.....	97	3	...	...	...	...	...
1846.....	108	7	...	...	...	...	...
1847.....	95	11	...	...	...	...	...
1848.....	81	6	...	...	...	...	...
1849.....	88	12	...	...	...	...	...
1850.....	80	6	...	...	...	...	...
1851.....	126	8	...	...	...	...	...
1852.....	143	6	...	...	...	...	...
1853.....	181	14	...	...	...	...	...
1854.....	150	10	...	...	...	...	...
1855.....	129	16	...	...	...	...	...
1856.....	112	13	...	...	...	...	...
1857.....	171	12	...	...	...	...	...
1858.....	188	9	...	...	...	...	...
1859.....	196	9	...	...	...	...	...
1860.....	140	9	...	...	...	...	...
1861.....	168	7	2	...	...	...	...
1862.....	64	5	...	...	...	...	...
1863.....	1	1	...	...	...	...	...
1864.....	Number of students from 1863 to 1865, 121	2	1	...	...	...	...
1865.....		7	2	...	...	...	...
1866.....	104	1	3	...	...	...	...
1867.....	87	7	4	...	...	...	...
1868.....	129	4	3	...	...	...	...
1869.....	144	3	2	...	...	...	...
1870.....	204	1	7	...	...	...	...
1871.....	217	8	...	...	...	...	...
1872.....	294	3	3	4	...	...	...
1873.....	407	3	16	1	...	...	75
1874.....	401	5	4	...	...	...	107
1875.....	396	4	6	2	...	...	101
1876.....	321	2	10	...	1	...	70
1877.....	399	4	7	1	2	...	64
1878.....	418	3	7	1	...	...	43
1879.....	444	6	3	8	1	...	71
1880.....	484	12	1	3	...	...	71
1881.....	558	6	11	2	...	...	96
1882.....	509	7	6	...	5	1	82
1883.....	491	7	9	...	10	2	110
1884.....	502	2	4	...	5	1	71
1885.....	459	4	7	...	5	2	72
1886.....	454	2	5	...	2	...	46
1887.....	530	8	2	...	2	...	59
1888.....	573	2	3	...	1	1	50
1889.....	580	4	8	...	4	...	65
1890.....	428	8	6	...	4	...	69
1891.....	487	†	†	...	†	...	80

In addition to the students above given, there were in the Model School in 1863, 173; in 1869, 50; in 1870, 36; in 1871, 21.

Number of graduates, A. B., from 1843 to 1860, 157; from 1861 to 1890, graduates, A. B., 130; S. B., 150; from 1872 to 1890, graduates, Ph. B., 22; N. S., 1; L. B. 42; A. D. B., 7.

† See programme of Commencement exercises

GRADUATES OF PROFESSIONAL SCHOOLS.

Years.	Normal Department.				Agricultural Department.			Law . . .	Medicine	Engineering.			Mines and Metallurgy.			Total No. of Graduates each year. . .		
	4 yrs.		6 years.		2 years.		2 years.	2 yrs.	6 years.			3 years.						
	N. G.	D. B.	Pe. B.	N. D.	Pe. P.	D. Ag.	D. H.	B. A. S.	Ag. B.	L. L. B.	M. D.	C. E.	T. E.	Sur.	C. E.		M. E.	Acad.
1869	4										†							4
1870	3																	3
1871	4																	4
1872	6																	6
1873		4																
1874		5		7						6								15
1875		4		18						13								61
1876		1		7						9								36
1877			1		6					14								36
1878			4		15					20						3		53
1879			9		8					14						1		52
1880			6		10					28						2		44
1881			3		8					13						1		55
1882			3		5					14						1		57
1883			11		3					23						4		53
1884			7		14					21						4		60
1885			9		20					33						3		66
1886			2		18					35						2		58
1887			5		29					†92						2		161
1888			4		27					†92						2		179
1889			7		15					26								*
1890			6		*					*								
1891			*		*					*								
	17	14	77	32	187		47	13	10	333	269	58	23	44	26	28	2	

*See programme of the Commencement exercises. †Graduated from Sec. No. 11, Medical College at St. Louis. (See Medical Dep't.)

‡From 1846 to 1856 there were 372 graduates from the Medical Department, then McDowell's Med. College, St. Louis.

THE SCHOOLS OF THE UNIVERSITY.

I. THE ACADEMIC SCHOOLS.

A. LANGUAGE.

- I—English.
- II—Latin.
- III—Greek.
- IV—Modern Languages.
- V—Hebrew.
- VI—Sanskrit.
- VII—Comparative Philology.

B. SCIENCE.

- VIII—Metaphysics.
- IX—Mathematics.
- X—Physics.
- XI—Chemistry.
- XII—Geology and Mineralogy.
- XIII—Biology.

II. THE PROFESSIONAL SCHOOLS.

- XIV—1. Agriculture.
- XV—2. Pedagogics.
- XVI—3. Law.
- XVII—4. Medicine.
- XVIII—5. Mining and Metallurgy.
- XIX—6. Engineering.
- XX—7. Military Science and Tactics.
- XXI—8. Art.
- XXII—9. Commercial.

I. SCHOOL OF ENGLISH.

Professor ALLEN—Assistant, Professor PENN.

Instruction is given in four courses corresponding to the scheme of work in the English language and literature, as laid down in the Literary (L. B.) course.

Less of books about the literature and more of the literature itself has been the leading thought in organizing these courses of study.

Methods of instruction: Lectures, text-books and recitations.

I. (FRESHMAN.) A course of reading, mainly biographical and historical, is prescribed, from which are drawn subjects and material for essays. The principles of written discourse are taught by text-book and lecture—two hours a week.

Text-book: Clark's practical Rhetoric.

II. (SOPHOMORE.) The history of English literature and the history of the English people are begun at the same time and carried on alternately—history twice, literature three times a week. History is completed the first term, literature continues through the second. The classics of the modern period—beginning with Chaucer and following, in historical order, with Spenser, Shakspeare, Bacon, Milton and other representative writers in prose and verse—are studied and critically read in the class-room through both terms. Besides, parallel readings from these and other authors are assigned for private study. Essays on literary and historical subjects are regularly required.

First term: Five hours a week. Second term: Three hours a week.

Text-books: Stopford Brooke's History of English Literature; Montgomery's English history; English Classics (Clarendon Press Series).

For reference: Green's History of the English People; Minto's Manual of English Prose; Ward's English Poets; Saintsbury's Elizabethan Literature; Stedman's Victorian Poets.

III. (JUNIOR.) In the first semester the history of the English language is given by lectures and text-book, and master-pieces of the literature are read with special reference to the structure of the language. Three hours a week.

In the second semester the time is given wholly to the study, in style and invention, of modern prose. Essays are required of this class at regular intervals. Three hours a week.

Text-books: First semester, Lounsbury's History of the English Language; Sweet's Anglo-Saxon Primer; English Classics.

Second semester: Genung's Rhetorical Analysis; Prose Authors.

IV. (SENIOR.) The studies in this course are philological rather than literary. The historical study of the language is pursued through both semesters, beginning in the first semester with the oldest forms of the language, and continuing, by the study of specimens, to the close of the old English (Anglo-Saxon) period, about 1150 A. D. Two hours a week. (Elective).

In the second semester the study of specimens is continued through the middle English period to about 1350; then on through the age of the founders, Langland, Wicliff, Chaucer, to 1400—a date which marks the death of Chaucer, and brings us into the modern English period, where the literature of course II begins. Two hours a week. (Elective).

Text-books: First semester, Sweet's Anglo-Saxon Reader; Earle's History of Anglo-Saxon Literature.

Second semester, Sweet's Primer of Middle English; Morris and Skeat's Specimens of Early English. Part II.

A post-graduate course is provided for students desiring to carry on further their studies in English. The following will indicate in a general way the work done in this course:

Prose Readings: Beowulf; March's Comparative Grammar. Original work in English Philology is required in this class.

Preparatory courses introductory to the Freshman class are outlined in the schedule of preparatory work. They embrace a thorough course of grammar and analysis, composition and rhetoric, U. S. history and American literature.

A special medal, known as the "McAnally Medal," is offered for competition in the Senior year. It is for the best essay, thesis or poem by members of the Senior class, competing under certain rules laid down by the founder of the prize.

The subject for 1890-91 is "Gladstone, Statesman and Man of Letters."

ENROLLMENT OF STUDENTS.

Post-graduate.....	1	
Anglo-Saxon (elective).....	5	
Middle English (elective in part).....	9	
Junior.....	38	
Sophomore.....	60	
Freshman.....	64	177
PREPARATORY.		
Second year.....	156	
First year.....	109	265
Total enrollment.....		442
Individual students.....		341

II. SCHOOL OF LATIN LANGUAGE AND LITERATURE.

Professor FISHER—Professor JONES, *Associate*.

[The head of this department died February 20th. Since that time Professor Jones has been in charge of the work, with Mr. J. F. Paxton as assistant.]

The subjects taught in this department are the Latin Language and Literature; the Geography, Mythology, Antiquities and History of the Romans.

FIRST YEAR.

First Semester—Collar and Daniell's Beginner's Latin Book to chapter XXXIX.

Second Semester—Collar and Daniell's Beginner's Latin Book completed. When the verb is reached the class masters the *whole verb*, not simply parts of it.

SUB-FRESHMAN—SECOND YEAR.

First Semester—Harkness' *Cæsar* (De Bollo Gallico) Books I, II; Harkness' *Grammar to Prosody*; Arnold's *Latin Prose Composition to the Genitive*, chapter VIII; *Reading at Sight* (Bennett's *Easy Latin Stories*); *Classical Geography*, pp. 17-19, 23-31; also *Mythology*, pp. 68-84 (Baird's *Classical Manual*.)

Second Semester—Greenough's *Virgil—Æneid*, Books I, II; Arnold's *Prose Composition to the Accusative*, chapter X; *Reading at Sight*; *Mythology Completed and Reviewed* (Baird's *Classical Manual*, pp. 68-97; also pp. 170, 171).

FRESHMAN CLASS.

First Semester—Livy, Sallust, *Grammar*, *Composition to chapter XIX*, *Antiquities*.

Second Semester—Horace—*Odes and Epodes*, *Prosody*, *Composition to Part II*, *Antiquities*.

SOPHOMORE CLASS.

First Semester—Horace—*Satires and Epistles*, Tacitus, Agricola, *Grammar*, *Composition, Part II*, *Roman History*, *Lectures*.

Second Semester—Cicero, *Tusculans*, *De Amicitia*, *De Senectute*, *Grammar*, *Composition, Part II to page 263*, *Translations into Latin*, *Roman History*.

JUNIOR CLASS.

First Semester—Plautus—*Captives*, *Critical Study of the Grammar*, *Translations into Latin*, *Lectures in Latin*, *Selections from the Poets*, *Lectures on Ancient and Modern Rome*.

Conversation in Latin and reading at sight are required of all classes. Translations at sight of passages from both prose and poetry *will be required of all who seek admission to the University classes*. The Roman pronunciation is carefully taught and strictly followed in the class-room. During the course, lectures will be delivered to all the classes in the department on Archæology and Art. The means of illustration in this direction are equal to any in use in our country.

Sight, oral and written Latin in all classes.

*Candidates for the Freshman class, who have pursued their preparatory studies in other institutions, will be examined in the following books or their equivalents:

*Schools, whose work has been brought into articulate connection with that of the University, are referred to the first two years as given above.

Latin Grammar (including Prosody), Arnold's *Latin Composition to Chapter X*, four books of *Cæsar*, four books of *Virgil* (including Scanning), Cicero's *Orations* (four), *Classical Geography*.

TEXT-BOOKS.

Harkness' *Grammar*, *Cæsar*, Cicero, Arnold's *Composition*; Greenough's *Virgil*, Ginn and Heath's *Classical Geography*; Baird's *Classical Manual*; Anthon's *Horace*; Bennett's *Second Latin Writer*; Creighton's *History of Rome*; Harrington's *Plautus*; Tyler's *Tacitus*; *Latin Prose Selections*—Weale's *Classical Series*; Crowell's *Selections from the Latin Poets*; Lincoln's *Livy*; Chase & Stuart's *Tusculan Disputations*, *De Amicitia* and *De Senectute*.

BOOKS OF REFERENCE.

Harper's Latin Dictionary; Smith's Dictionary of Roman Antiquities; Momm-
sen's History of Rome; Teuffel's History of Roman Literature; Ramshorn's Latin
Synonyms; Becker's Gallus, Daubeney's Roman Agriculture; Guhl and Koner's
Life of the Greeks and Romans; Grammars of Gildersleeve, Madvig and Roby;
Fisher's Three Pronunciations of Latin.

ELECTIVE COURSES.

I.

Poets: Juvenal and Martial, two hours a week.

Roman Philosophers, two hours a week.

II.

Lectures on Archæology, two hours a week.

Lectures on the Fine Arts, three hours a week.

Teacher's Course, two hours a week.

III.

For L. B. students, same as Juniors in A. B. course.

The department has a collection of photographs, slides, inscriptions, charts,
maps, rubbings and antiquities, recently brought from Italy, of great value in the
prosecution of the higher scholarship. The set of imperial coins is of peculiar in-
terest. The elective courses of the Junior and Senior years offer special oppor-
tunities in rapid reading; interpretation of authors and archæology. A training
course is offered in the Senior year to those desiring to fit themselves to teach the
classics. Lectures will be given on methods of teaching Latin; practice in writing
Latin; interpretation and criticism of selections from Virgil, Cæsar and Cicero.

STUDENTS IN THE SCHOOL OF LATIN.

There have been 295 students enrolled in this department during the session of
1890-91.

The Appleton prize is offered for competition in the Sophomore and Junior
classes. It will be awarded in 1890-91 to the student who makes the best translation
into Latin of Ben Hur, Book V, chap. XII, beginning with the words "There was
a basement first," and closing with "Such are the cries." At the commencement
of 1890 the Appleton prize was awarded to Mr. F. P. Divelbiss.

III. SCHOOL OF THE GREEK LANGUAGE AND LITERATURE.

Professor MANLY.

The subjects taught in this department are the Greek Language and Literature, the Geography, History, Mythology and Antiquities of Greece.

FRESHMAN CLASS.

First Semester—

Author read Xenophon (for session '91-'92 Memorabilia).

The aim is to give students facility in reading Attic prose and a thorough drill in the forms and syntax; also an outline of Greek History.

Text-books: Xenophon's Memorabilia, Goodwin's Greek Grammar, Jackson's Greek Prose Composition, Pennell's History of Greece.

Second Semester—

Herodotus is studied.

The student is made acquainted with the Ionic dialect of Herodotus. Study of the grammar is continued, and mythology is taken up.

Text-books: Herodotus (McMillan), Mythology (Keightley), Goodwin's Greek Grammar, Jackson's Composition.

SOPHOMORE CLASS.

First Semester—

This semester is devoted to the study of Homer. The dialect, syntax and other peculiarities are carefully noted. Students are practiced in scanning. Theses are required on points of Homeric Grammar or Homeric life. Weekly translations from English into Greek form part of the work.

Text-books: Homer (Teubner Ed.: Leipzig), Goodwin's Greek Grammar, Autenrieth's Homeric Dictionary (Harper Bros.: N. Y.). Students are referred to other works for collateral reading.

Second Semester—

The work is on Demosthenes. Some oration or orations of Demosthenes are read and made the basis of minute study as to grammar and style. The student is given an outline of Greek Literature. Weekly translations from English into Greek, modeled after Demosthenes, are required. Lectures are given on the Attic Orators.

Text-books: Demosthenes (for session '91-'92 Demosthenes' Philippics, by Tarbell (Ginn & Co., Boston), Goodwin's Greek Moods and Tenses, Jebb's Greek Literature (Appleton, N. Y.).

JUNIOR CLASS.

First Semester—

This semester is devoted to the study of Greek Tragedy. Lectures are delivered on the origin and development of tragedy, on tragic presentation, etc. Plays of Æschylus, Sophocles or Euripides are read. Practice is given in scanning.

Text-books: For session '91-'92, Euripides' Alcestis and Medea, Goodwin's Greek Moods and Tenses.

Second Semester—

Comedy is studied, particularly as illustrated by Aristophanes. Several plays will be read and lectures delivered on Comedy.

ELECTIVES.

Greek A. Life of the Greeks, Antiquities, etc. Three hours a week.

This course is required of candidates for the degree of L. B., and is an elective to all other students. No knowledge of the Greek language is *required* for this course, but it is very desirable that students should have had at least one year of Greek in order to get the full benefit of the course. Lectures will be delivered on the temples and other public buildings, private houses, public duties and home-life of citizens, legislative assemblies, arms, games, festivals, marriage, death and burial, etc. These subjects will be illustrated by maps, charts, lithographs and stereopticon views.

Greek B. New Testament.

Parts of the New Testament will be read and treated from a literary point of view. The language and grammar will be compared with that of Attic Greek.

Greek C. Sight Reading.

This course is intended to give students the power to read Greek rapidly at sight. This will be of great benefit to all students in the regular Greek classes by increasing their vocabulary and enabling them to read without a dictionary. The work will be carefully graduated so that the student will advance by easy stages to harder authors.

PREPARATORY COURSE.

This course is intended for students not prepared to enter the Freshman class.

First Semester—Frost's Greek Primer, or Rutherford's First Greek Grammar, Moss' First Greek Reader.

Second Semester—Xenophon's Anabasis, Goodwin's Greek Grammar, Tozer's Geography (Appleton, N. Y.), Kiepert's or Ginn's Classical Atlas.

ENROLLMENT FOR '90-'91.

Seniors	3
Juniors	8
Sophomores	21
Freshmen	34
Total	66

IV. SCHOOL OF MODERN LANGUAGES.

Professor BLACKWELL—*Assistant*, Professor HOFFMAN.

Courses of instruction are outlined as follows :

GERMAN.

I. Whitney's Brief German Grammar, Elementary Reader.

II. Whitney's Revised Grammar; Reader completed; Blackwell's Manual of Prefixes and Suffixes, weekly recitations.

III. Grammar, weekly recitations; Literary and Scientific Prose Readings; Manual completed; Studies in Synonyms.

IV. Prose composition daily; Heine's "Harzreise," "Goetz von Berlichingen;" Study of Style; lectures on Language and Literature weekly.

Classes recite every day in the L. B. and S. B. courses.

OPTIONAL COURSES IN GERMAN.

V. Egmont; Study of the Drama; The Laocoon.

VI. Nathan der Weise; Themes; Schiller's Tell.

VII. Faust; Themes.

VIII. Studies in Herder, Richter and Schiller; General Review.

Composition throughout the Optional course.

Equivalent work to the above course will receive acknowledgment.

All optional studies to be timed at the convenience of the professor and students.

The post-graduate course will embrace studies in Middle High German (Paul's "Mittel hochdeutsche Grammatik, der arme Heinrich, the Nibelungenlied"), Old High German, and Comparative Teutonic Philology.

FRENCH.

I. Edgren's Grammar; Super's Reader.

II. Grammar and Reader completed; "Tableaux de la Revolution Francaise."

III. "Le Roman d'un Jeune Homme Pauvre," by Octave Feuillet; "Le Romantisme Francais;" Composition.

IV. Composition; Study of Synonyms; "Le Nabab," by Alphonse Daudet; Moliere's "Bourgeois Gentilhomme;" Lectures on the Language and Literature.

Classes meet four times a week in the Freshman, and three times a week in the Sophomore year.

OPTIONAL STUDIES.

V. "Eugenie Grandet," by Balzac; Selections from Moliere; Study of Style; Themes.

VI. "Numa Roumestan," by Daudet, selections; Lamartine's Poems, selections; "Ruy Blas," by Victor Hugo; Study of Prosody; Themes.

VII. Selections from "Les Miserables" of Victor Hugo; "Les Trois Mousquetaires," by A. Dumas; Themes.

VIII. Studies in Racine and Corneille, and the drama; General Review of the work.

Composition throughout the Optional course.

Equivalent work will receive acknowledgment.

All optional studies to be timed at the convenience of the professors and students.

Post-Graduate studies embrace work in Old French, the "Langue d'Oil," Provençal (Bartsch, Burguy, Kitchin), and Romance Philology (Diez, Meyer, French editions of both preferred.)

OPTIONAL STUDIES.

SPANISH.

I. Knapp's Grammar and "Lecturas de Clase."

II. Grammar continued; Knapp's Readings.

III. Gaspar's "Castigode Dios;" Selections from Don Quijote.

IV. Lope de Vega's "Dorotea;" selections from the Cancioneros; History of Spanish Literature (Ticknor).

Post-graduate studies will include studies of Calderon, "Garcilasso de la Vega," and attention to Catalonian and Valencian Literature.

These studies at the time and convenience of the professor.

ITALIAN.

I. Grandgent's Grammar; Easy Readings.

II. "Il Marco di Visconte;" Fanfani's Synonyms.

III. Cologero's "Novelle Calebresi;" Tasso's "Giurusalemme Liberata," four cantos.

IV. The Prince of Machiavelli; selections from the Purgatorio of Dante; History of the Literature.

Post-graduate studies will include studies in Ariosto, Petrarch (Le Rime and Le Lettere, especially), Dante, and modern poets.

These studies at the time and convenience of the professor.

PORTUGUESE.

I. Cabano's Grammar; Historia do Brazil (Ginn).

Four semesters in Spanish, or Italian or French, necessary for entrance.

At the time and convenience of the professor.

RUSSIAN.

I. Reiff's Grammar; Riola's Reader.

II. Reiff and Riola continued; Vogue's "Russkyie Pisateli."

III. Selections from Tolstoi's "Voina i Mir."

Candidates must have had four semesters in German, or Latin, or Greek.

At the time and convenience of the professor.

Total enrollment of students in modern languages in the year 1890-91, 155.

V. SCHOOL OF SEMITIC LANGUAGES.

Professor BLACKWELL.

The courses offered are as follows:

HEBREW.

- I. Harper's Method and Manual.
 - II. Harper's Elements; Books of Ruth and Esther.
 - III. Harper's Syntax; The Psalms; Driver's Tenses; Ancient History.
 - IV. Study of Isaiah (Alexander, Cheyne and Delitzsch); Wickes' Accent.
- Post-graduate studies will include post-biblical literature, the Pirke Aboth from the Mishna (Taylor), and the Pentateuchal Question.

(Delitzsch, Dillmann, Wellhausen, Kuenen, Bissell, Harman, Harper, Green and others.)

ARAMAIC.

- I. Brown's Grammar and Reader.
 - II. The Targums.
- Two semesters of Hebrew are necessary for entrance.

SYRIAC.

- I. Nestle's Grammatik and Chrestomathie.
 - II. Bagster's Peshitto New Testament and Lexicon.
- Two semesters in Hebrew necessary for entrance.

ARABIC.

- I. Lansing's Grammar and Chrestomathy.
- II. Wright's Reading Lessons; Wortabet's Dictionary; first two surahs of the Koran.

Two semesters of Hebrew are necessary for entrance.

Instructions and lectures to twenty-three in the School of Semitic Languages in 1890-91.

VI. SCHOOL OF SANSKRIT.

Professor BLACKWELL.

- I. Perry's Sanskrit Primer; Whitney's Grammar.
- II. Story of Nala; Hitopadega; Dharmagastra.
- III. Hymns to Agni and Varuna, and the Funeral Hymns of the Rigveda; Brahmanas.

Five students pursued this work in the year 1890-91.

VII. SCHOOL OF COMPARATIVE PHILOLOGY.

PROFESSOR JONES.

The instruction given in this Department is confined to classical philology. It extends through the Junior year and is given wholly by lectures. The first semester's work consists in the exposition of the general principles of the science of language. In the second semester the work covers the Phonology, Morphology and Comparative Syntax of Greek and Latin. For want of time, no elective courses can now be offered.

There have been fourteen (14) students enrolled during the session of 1890-91.

VIII. SCHOOL OF METAPHYSICS.

PROFESSOR ———.

Psychology—Lectures: Hamilton's Metaphysics, Mahan's System and Sully's Outlines.

Logic—Lectures: Jevons, Hamilton, Mill.

Ethics—Lectures: Paley, Wayland, Alexander, Lieber's Political Ethics, Porter.

Social Science—Lectures: Lieber's Civil Liberty, Spencer's Sociology.

Philosophy—Lectures.

The History of Philosophy—Lectures: Schwegler, Ueberweg.

Notes on all lectures are required, criticised and graded for literary character, as well as for matter. The instruction is chiefly by lectures.

Æsthetics and Political Economy.

Constitutional and International Law—The academic students join the law class in these subjects, and also receive from the department instruction in the law of contracts.

DEPARTMENT OF MATHEMATICS AND ASTRONOMY.

W. B. SMITH, Professor. W. C. TINDALL, Associate. MILTON UPDEGRAFF, Assistant.
W. W. GLENDENIN, Assistant.

The following courses are proposed :

1 and 2. Solid Geometry, Plane and Solid Trigonometry.—Freshman, both terms, thrice weekly, at 2 and 3 p. m. Texts: Hayward's Solid Geometry, Smith's Clew to Trigonometry—Observatory practice.—Updegraff.

3 and 4. Advanced Algebra.—Permutations, Combinations, Homogeneous Products, Binomial and Multinomial Theorems, Convergency, Part-Fractions, Exponentials, Logarithms, Summation of Series, Continued Fractions—Freshman, both terms, twice weekly, at 2 p. m. Text: Smith's Treatise on Algebra, beginning with Chapter XVIII.—Smith or Tindall.

5 and 6. Analytic Geometry.—Sophomore; first term, twice weekly; second term, four times weekly, at 3 p. m. Text: Smith's Co-ordinate Geometry.—Smith and Tindall.

7 and 8. Determinants.—Sophomore, both terms, once weekly, at 3 p. m. Lectures, with numerous examples and applications drawn from Muir, Salmon, and others.—Smith.

9. General Astronomy.—Senior, second term, thrice weekly, at 12 m. Text: Young's General Astronomy, the more important parts, beginning with chapter 7.—Updegraff.

All the foregoing courses are required for the degree of S. B., and all but 3 and 7, 7 and 8, for the degrees of A. B. and L. B.

ELECTIVE.

10 and 11. Infinitesimal Calculus.—Junior, both terms, five times weekly. Smith's notes, with illustrative examples drawn from various sources.—Smith or Tindall.

12 and 13. Theory of Equations and Quantities.—Junior, both terms, thrice weekly. Text: Burnside and Panton's.—Tindall.

14 and 15. Higher Analytic Geometry.—Junior, both terms, thrice weekly. Text: Smith's or Frost's.—Smith or Tindall.

16 and 17. Differential Equations.—Senior, both terms, thrice weekly. Text: Forsyth's or Johnson's.—Smith.

18 and 19. Practical Astronomy.—Junior, both terms, four times weekly. Text: Loomis's, with Chauvenet's and Doolittle's for reference. Courses 1, 2, 3, 4 presupposed. —Senior, both terms, four times weekly. Texts: Chauvenet's and Watson's. Courses 5, 6, 10, 11 presupposed. Original work encouraged and expected.—Updegraff.

20. Least Squares.—Senior, first term, thrice weekly. Text: Merriman's.—Updegraff.

Post-graduates may be directed in reading Biermann's *Theorie der Analytischen Functionen* (nach Weierstrass.)

Electives are subject to considerable variation in time and topic, from session to session, according to the conjoint judgment of teachers and electors.

The uniform condition of admission to any course is knowledge presumptively adequate to profitable pursuit of the subject therein treated; but all except special students, and they so far as practicable, are strongly urged to keep their work abreast with itself—not to attempt in the same year studies classified under different years. For the Freshman courses, 1 and 3, such knowledge is assured by mastery of the first 273 pages of Smith's *Treatise on Algebra* (Macmillan & Co.), and the first 177 pages of Dupuis's *Elementary Synthetic Geometry* (Macmillan & Co.). No degree of familiarity with current texts can be reckoned as *equivalent* to such mastery, for the point of view in the works named is altogether another—a modern and a higher; yet the candidate presumably prepared to make good, if not the best, progress in Solid Geometry and in Trigonometry, may be admitted conditionally to the Freshman class. The courses in this latter presuppose only a little more than one year's study of Algebra, and a little less than one year's study of Geometry, but with proper aids.

THE OBSERVATORY.

MILTON UPDEGRAFF, director.

The observatory is pleasantly situated on the campus in front of the main building of the University, and is a building over sixty feet long, equipped with the following instruments:

1. A 7½-inch Refracting Equatorial telescope, made by Merz and Mahler, of Munich, furnished with a driving clock, position filar micrometer, two spectroscopes, by Fauth & Co., twenty eye-pieces, adapters, etc.
2. A 2½-inch Transit Instrument, by Brunner of Paris, with a divided circle in declination, read by two verniers to 3 seconds of arc—the whole being a miniature meridian-circle.
3. An Altitude and Azimuth instrument, by Blunt of New York, aperture 2 inches, and also a Sextant by the same maker.
4. An excellent Sidereal Clock, by Fauth & Co., of Washington, and a Mean Time Clock, by Gregg & Rupp, of New York.
5. A Chronograph, by Fauth & Co., Theodolite, by Gregg & Rupp, 20-inch Celestial Globe, electrical apparatus and other smaller instruments.

The instruments are mounted on piers of solid masonry isolated from the floor and walls of the building. The dome of the equatorial telescope is 17½ feet in diameter, and is made of wood covered with sheet-iron. It is supported by an octagonal brick tower at the east end of the building, and revolves on wheels that run on a cast-iron track. The telescope is mounted on a wooden stand, which rests on a brick pier. The west end of the building is surmounted by a cone 14 feet diameter, which revolves on cannon balls, and shelters the altitude and azimuth instrument. The Transit-room has three slits for observation, and contains the transit instrument, chronograph and sidereal clock.

The Observatory is provided with the principal astronomical periodicals of this country and of Europe, and a valuable collection of star-catalogues and other standard astronomical books is being made. When certain very necessary im-

improvements now in progress, or which are contemplated, are completed, it will be one of the best equipped observatories for instruction in the Mississippi Valley.

The course in Practical Astronomy comprises instruction in the use of portable instruments for determination of Time, Latitude and Azimuth, and also in the computation of predictions of eclipses of the sun and moon, and of transits of the inferior planets. Whenever possible, observations of these phenomena are made, and thus the accuracy is tested of both computation and observation. Students, when sufficiently advanced, undertake a series of micrometric or spectroscopic observations with the equatorial telescope, and perform the mathematical calculations involved in the reduction of the same.

The Observatory is primarily and principally devoted to instruction in the art and science of Astronomy. But the best instruction in science can be given only in connection with scientific activity, and an effort is made to accomplish as much useful astronomical work as is possible under the circumstances. During the present scholastic year repairs and alterations of the buildings and instruments rendered such work impossible until December 1, 1890. Since that date observations for time have been regularly made and various instrumental constants have been investigated. About forty micrometric observations of the positions of comets and planets have been made, some of which have been published in the *Astronomical Journal* of Cambridge, Mass., while the others are being prepared for publication.

A gold medal, known as the "Missouri University Astronomical Medal," is awarded annually at Commencement to that student of the graduating class who stands highest in Theoretical and Practical Astronomy. A standing of 90 per cent. in general scholarship and an original thesis on some astronomical subject are required.

THE PREPARATORY COURSES

Extend through two years, with recitations five times weekly, as follows :

Ia. Algebra (Smith's Elementary to Ratio and Proportion, pp. 1-240), both terms, thrice weekly.

Ib. Geometry (Dupuis's Elementary Synthetic to Areal Relations, pp. 1-118), both terms, twice weekly.

IIa. Algebra (Smith's Elementary, completed ; Smith's Treatise, select parts to page 273), both terms, thrice weekly.

IIb. Geometry (Dupuis's Elementary Synthetic, pp. 119-251), both terms, twice weekly.

These courses are required for the degree in Agriculture (B. Agr.), and either they or what may be treated as equivalent for admission to the Freshman class. All except the fourth term are required for the Normal certificate.

Candidates for Course I will be examined in Arithmetic, to ascertain whether they have knowledge sufficient for the successful study of Algebra. Such as display knowledge deemed sufficient, if it be yet incomplete or imperfect with respect to some part of arithmetic, may be admitted to the course on condition of making good the deficiency before promotion to a higher class.

It is hoped that a Modern Geometry, now far advanced in preparation, may be ready for use by next September. In this work the "rupture with traditional antiquated methods, and alignment with the march of modern thought," so long desiderated, are complete. The definitions and axioms are based upon the profound researches of Riemann, and the treatment of parallels follows the paths struck out by Bolyai and Lobatschewsky. Of the four nearly equal sections, the first deals with Congruence ; the second with Symmetry, axial and central, and its embodiment,

the Circle; the third with Equality and Similarity; the fourth with the notions of Pole and Polar, Power-axis and Power-centre, centre and axis of Similitude, while the whole culminates in the solution of the Taction-Problem of Apollonius. This mention is made to convey some better idea of the range and method of study in this, the oldest, and at the same time youngest, of the sciences.

ENROLLMENT.

The numerals in parenthesis refer to the courses.

COLLEGIATE.		PREPARATORY.	
Geometry and Trigonometry (1, 2)	70	Elementary Algebra (Ia).....	99
Advanced Algebra (3, 4).....	23	Elementary Geometry (Ib).....	171
Co-ordinate Geometry (5, 6).....	44	Mediate Algebra (IIa).....	101
Determinants (7, 8).....	16	Mediate Geometry (IIb).....	38
General Astronomy (9).....	18	Individuals	<u>249</u>
Review of Algebra.....	17	Total Collegiate	208
Infinitesimal Calculus (10, 11).....	15	Total Preparatory	<u>469</u>
Equations and Quantics (12, 13).....	3	Total in the Department	<u>617</u>
Higher Co-ord. Geometry (14, 15).....	5	Total of Individuals.....	<u>357</u>
Doctrine of Rest and Motion.....	4	<i>Totals Compared.</i>	
Practical Astronomy (18, 19).....	3	1890-91.....	129 249 | 208 409 | 617 357
Least Squares (20)	7	1889-90.	90 197 | 156 383 | 539 264
Individuals	<u>129</u>		

To the foregoing summary of the work done in the Department should be added the instruction of a class of 28 in Metaphysics and Logic, the text being Lotze's Outlines, largely supplemented and illustrated.

X. SCHOOL OF PHYSICS.

JOSEPH G. NORWOOD, Professor Emeritus. MILLARD LEWIS LIPSCOMB, Professor, AUSTIN LEE McRAE, Assistant Professor.

THE INSTRUCTION IN PHYSICS.

This begins with a series of 50 recitations or lectures, attended by all students, during the second semester of the second preparatory year, in which the whole subject of physics is discussed in an elementary manner. This is followed by a series of 90 recitations or lectures, during the first semester of the Freshman year, which are intended to be introductory to the study of Chemistry. The subjects include the molecular and atomic theory of matter, the properties and states of matter explained by this theory, kinetic theory of gases, and a brief course in heat and electricity. Text-books on these subjects are studied, and are fully illustrated by lecture table experiments.

During the first semester of the Sophomore year, one afternoon per week is spent in the Physical Laboratory. The work there at first consists almost exclusively of quantitative measurements, and serves chiefly to train the student in the use of methods and instruments which are employed as accessories later. To this succeed experiments on the mechanics of solids, liquids and gases, each illustrating a method by which some physical law or constant is determined. Heat and electrical measurements complete the course.

During the second semester of the Junior year a series of 50 lectures or recitations on the general principles of physics is given. The subjects include sound, light, heat, electricity and magnetism. The branches are treated both mathematically and experimentally, and in all cases the theoretical discussion of a question is followed by a full account of its practical applications.

In addition to the instruction received in common with the other classes, the students in the scientific and engineering courses are required to take one afternoon per week during the first semester of the Sophomore year, and two afternoons per week during the second semester of the Junior year, in the Physical Laboratory. The work consists in the determination of the various physical constants and in the discussion of the observations, after which the student takes up such advanced work as his taste dictates and his skill permits.

Special instruction in the construction and manipulation of apparatus for lecture table experiments is given, as an elective, to those students who intend to become teachers.

Advanced laboratory work and reading courses in physics will be given to suit the individual needs of special students.

A fee of five dollars per semester is charged for laboratory instruction.

Text-books and Books of Reference—Deschanel's Natural Philosophy; Ganot's Physics; Maxwell's Theory of Heat; Thompson's Lessons in Electricity; Daniell's Principles of Physics; Glazebrook and Shaw's Practical Physics; Kohlrausch's Physical Measurements; Pickering's Physical Manipulations; Trowbridge's New Physics; Stewart and Gee's Practical Physics; Everett's Physical Constants; Kempe's Hand-book of Electrical Testing; Ayrton's Practical Electricity; Thompson's Dynamo-Electric Machinery; Kapp's transmission of Electrical Energy; Gray's Absolute Measurement; Maxwell's Electricity and Magnetism; Wiedemann's Elektrizität; Houston's Dictionary of Electrical Terms, Phrases, etc.; Mascart and Joubert's Electricity and Magnetism; Watson and Burbury's Mathematical Electricity and Magnetism; Stokes' Mathematical and Physical Papers; Ball's Experimental Mechanics; Goodeve's Principles of Mechanics; Rayleigh's Theory of Sound; Gore's Electro-Metallurgy; Schellen's Spectralanalyse; Pope's Telegraphy; Fiske's Electrical Engineering; Preece and Maier's Telephone; Cumming's Theory of Electricity.

THE PHYSICAL SEMINAR.

The object of this society is to develop general scientific culture, and at the same time to keep abreast with the current work and thought in special branches of science and engineering.

Meetings are held once a month, at which papers are read giving a review of the current scientific and engineering periodicals, with explanation and discussion of the most important articles. Special historical sketches are also read from time to time. The attendance at and participation in these meetings is voluntary, but judging from the interest manifested by the students during the past year, this society is doing a useful work.

LIST OF COURSES.

Physics I. Recitations and lectures three times per week during the second semester. Requisite for admission, a passing grade in the first preparatory.

Physics II. Recitations and lectures five times per week during the first semester. Requisite for admission, a passing grade in the second preparatory.

Physics III. Sophomore laboratory. Requisite for admission, a passing grade in Physics II.

Physics IV. Mechanics five times per week during the first semester of the junior year. Requisite for admission, a passing grade in sophomore mathematics.

Physics V. Advanced physics three times per week during the second semester of the junior year.

Physics VI. Junior laboratory.

Physics VII. Thermodynamics three times per week during the first semester.

Physics VIII. Electricity and Magnetism five times per week during the second semester.

Physics IX. Dynamo Electric Machinery, and the Technical Applications of Electricity, five times per week during one year.

Physics X. History of Physics two times per week during the first semester.

Physics XI. Electrodynamics five times per week during the second semester.

Physics XII. Mathematical Electricity and Magnetism five times per week for one year. (Elective.)

Physics XIII. Theory of Potential five times per week during the first semester. (Elective.)

After completing the prescribed course of physics for any degree, a student may take any of the higher courses of physics as electives.

ENROLLMENT OF STUDENTS FOR 1890-1891.

Physics I.....	71	Physics VI	9
Physics II	109	Physics VIII.....	8
Physics III.....	40	Physics IX.....	4
Physics IV.....	13	Elective laboratory	7
Physics V	6	Total.....	267

XI. DEPARTMENT OF CHEMISTRY.

Professor SCHWEITZER.

CLARENCE L. SPEYERS, PH. B., First Assistant.

SILAS DINSMOOR, PH. B., Second Assistant.

I. ARRANGEMENT OF CLASSES BY SEMESTERS.

FIRST SEMESTER.

- 10-11 (5 hours). Phenomenal Chemistry, Schweitzer, Speyers.
 11-12 (4 hours). Rational Chemistry, Schweitzer.
 12- 1 (2 hours). Thermo-Chemistry, *optional*, Speyers.
 12- 1 (3 hours). Thermo-Chemistry, *optional*, Speyers.
 Laboratory work, Speyers, Dinsmoor.

SECOND SEMESTER.

- 9 -10 (3 hours). Organic Chemistry, *optional*, Schweitzer.
 10-11 (3 hours). Physiological Chemistry and Toxicology, Schweitzer.
 10-11 (2 hours). Applied Chemistry, *optional*, Schweitzer.
 11-12 (3 hours). Agricultural Chemistry, Schweitzer.
 11-12 (2 hours). Applied Chemistry, *optional*, Schweitzer.
 Laboratory work, Speyers, Dinsmoor.

II. CONSECUTIVE ARRANGEMENT OF CLASSES.

1. Phenomenal Chemistry, Freshman year, first semester.
2. Laboratory work, Young Chemist and Qualitative Analysis, Sophomore year, second semester.
3. Rational Chemistry, Junior year, first semester.
4. Organic Chemistry, Junior year, second semester, *optional*.
5. Physiological Chemistry and Toxicology, *professional*.
6. Applied Chemistry, Junior year, second semester, *optional*.
7. Laboratory work, Quantitative Analysis, Junior year, second semester.
8. Agricultural Chemistry, *professional*.
9. Thermo-chemistry, Senior year, first semester, *optional*.
10. Thermo-dynamics, Senior year, first semester, *optional*.
11. Laboratory work, selected subjects in Quantitative Analysis, Senior year, first and second semester.

III. SYNOPSIS OF WORK.

FRESHMAN YEAR, FIRST SEMESTER.

1. *Phenomenal Chemistry*, 5 hours, 10-11 a. m., an elementary course of instruction, consisting in experimental demonstrations of the facts of the science, and embracing both the metalloids and the more common of the metals; calculations of

quantities by weight and volume, of changes in the volume of gases by changes of temperature and pressure, writing of reactions, and establishing of formulas upon proper physical facts, accompanying the work. (Ira Remsen : An introduction to the study of chemistry.)

SOPHOMORE YEAR, SECOND SEMESTER.

2. *Chemical Laboratory*, 2½ hours in course in Arts and Letters, and 5 hours in course in Science; in the former the student is trained in the use of apparatus and the art of making experiments; the experiments are simple, illustrative of the properties of substances and adapted to district school teaching. (Appleton: The Young Chemist.) In the latter, qualitative analysis follows preceding work; practice is given in the separation and detection of all the more common bases and acids in simple compounds as well as in complex mixtures. (Curtman: Lessons in qualitative and volumetric chemical analysis.)

JUNIOR YEAR, FIRST SEMESTER.

3. *Rational Chemistry*, 4 hours, 11-12 a. m.; the principles of Chemical Philosophy, with a general review of unorganic chemistry. (Coke: Principles of Chemical Philosophy, Part I.)

4. *Organic Chemistry*, 2 hours, 11-12 a. m.; a general view of subject; detailed treatment of monatomic alcohols, acids and derivatives; aromatic compounds; compound ammonias; alkaloids.

JUNIOR YEAR, SECOND SEMESTER.

5. *Physiological Chemistry and Toxicology*, 3 hours, 10-11 a. m.; general introduction; constituents of the body; inorganic histogenic and products of retrogressive metamorphosis; blood and related fluids; milk and other secretions; urine, healthy and pathological.

Poisons, their classification, description, recognition; action of poisons; their detection and isolation in judicial investigations.

6. *Applied Chemistry*.—This subject is divided into two distinct courses.

a. *Public Health and Hygiene*, 2 hours, 10-11 a. m.: *Air*, respiration, vitiated air and ventilation; infection, contagion, germ theory of disease. *Water*, potable water, hard and soft; impurities in it, such as lead and sewerage matter, and their effects upon health and life; mineral and other waters. *Food*, composition and general properties; bread, meat, milk, sugar; preservation of food, and food adulterations. *Illuminants, Disinfectants, Antiseptics*.

b. *Selected Chemical Industries*, 2 hours, 11-12.

5. *Chemical Laboratory*, 5 hours; quantitative analysis of ten compounds. (Cairns: Manual of Quantitative Chemical Analysis.)

Agricultural Chemistry, 3 hours, 11-12 a. m.; general introduction; functions on the plant, including production, conversion, transportation, deposition of organic matter; physiological structure of the cell; respiration; the green cell an apparatus for doing work dependent upon light and heat; nitrogenous constituents of the plant and their relation to free and combined nitrogen; mineral constituents; membraneous diffusion; assimilation; condition of vegetation.

Soil, its formation, composition, alteration by mechanical, chemical, biological agencies; its relation to light, heat and moisture.

Manures, natural and artificial; their composition, application, value.

SENIOR YEAR, FIRST SEMESTER.

9. *Thermo-chemistry*, 2 hours, 12-1 p. m.; historical sketch of subject; conservation of mass and energy; mechanism of molecules; calorimetry; thermal methods and problems. (Muir: *The Elements of Thermal Chemistry*.)

10. *Thermo-dynamics*, 3 hours, 12-1 p. m.; historical view of Chemistry and Physics—*a.* from Aristotle to beginning of 19th century, two weeks; from 19th century to present time, one week. (Kopp, *Geschichte der Chemie*; Poggendorff, *Geschichte der Physik*); *b.* discussion of Berthollet's theory (Berthollet, *Essai de Statique Chimique*), one week. Study of application of Thermo-dynamics to solving chemical and physical problems. Instruction by lectures, based upon P. Duhem. *Le Potentiel Thermo-dynamique et ses Applications*; Calculus required.

11. *Chemical laboratory*, 2½ hours; selected subjects in practice of Quantitative Analysis.

SENIOR YEAR, SECOND SEMESTER.

12. *Chemical laboratory*, 2½ hours; selected work.

IV. NUMBER OF STUDENTS IN THIS DEPARTMENT DURING THE SCHOLASTIC YEAR JUST ENDED.

103 students in Phenomenal Chemistry, 2 divisions.

30 “ Rational Chemistry.

45 “ Applied Chemistry.

3 “ Agricultural Chemistry.

25 “ Toxicology.

11 “ Organic Chemistry.

125 “ Laboratory, of whom—*a.* 83 Young Chemist.

b. 32 Qualitative Analysis.

c. 11 Quantitative Analysis.

—
342 students.

The Normal class, numbering 19, and the Junior Law class, have received instruction in this department not specifically mentioned.

XII. SCHOOL OF GEOLOGY AND MINERALOGY.

Prof. G. C. BROADHEAD—W. W. CLENDENIN, Assistant.

MINERALOGY AND LITHOLOGY.

Students in Arts, Science and Engineering courses are required to take the course in Mineralogy and Lithology.

Science and Engineer students receive instruction in this course four days of each week during the Second Semester of the Junior year, with one afternoon each week for Laboratory work.

A. B. students receive instruction in Mineralogy and Lithology three times a week during the Second Semester of the Junior year.

In Physical Mineralogy, students will be given instruction in Crystallography, until they have become familiar with all the more common forms of crystals; will be taught to measure the angles of crystals; will study the physical characters of Minerals, such as H. Sp., Grav., effect upon light, action under polarized light, etc.

To students who do not make Mineralogy and Lithology a special study, but little instruction in chemical mineralogy will be given, only touching the action of the more common minerals and ores with acids and blowpipe. Most of the work will be done in descriptive mineralogy, taking up those minerals which are important (*a*) in rock making, (*b*) as ores of useful metals, (*c*) as constituting gems, and (*d*) on account of their economic value. Especial attention will be given to Missouri minerals. The course of Lithology embraces the study of the composition, structure and origin of the most important rocks.

To students who elect to do special work in Mineralogy and Lithology will be furnished facilities for work in Mathematical Crystallography and optical investigations of minerals; also a systematic and comprehensive course in Determinative Mineralogy; and in Lithology, students will be assisted so far as the facilities afford.

Fees to cover use of apparatus and material will be charged.

For admission into class in Mineralogy students are required to have taken a course in Chemistry.

Text and reference books:

J. D. Dana's "Manual of Mineralogy;" E. S. Dana's "Text-book of Mineralogy;" Brush's "Blowpipe Analysis;" Elderhorst's "Determinative Mineralogy;" Von Kobell's "Work on Determinative Mineralogy."

PHYSICAL AND ECONOMIC GEOLOGY AND MINERALOGY.

Instruction in this course will be given to the agricultural and engineering students. The instruction is by lectures upon Economic Geology and Mineralogy, Lithology, Physical Geology and Geological Surveying—embracing the study of building materials, decomposition of rocks and production of soils, useful minerals occurring in veins and beds, coal deposits and the ordinary useful mineral substances, and surface Geology applied to engineering and agriculture. This course extends over one semester, with supplementary work in Laboratory.

Text-book: Williams' Applied Geology.

As often as practicable the rich mineral resources of Missouri will be discussed and its geology referred to.

The B. S. students during the second semester of the Senior year will devote a large portion of their time to the study of Palæontology and determination of fossils, and will occasionally have practice in Field Geology. The course in Palæontology will be mainly by lectures and the study of fossils.

To students who elect to take a special course, opportunity for field work will be given during both semesters.

PHYSICAL GEOGRAPHY.

The course in Physical Geography is illustrated by charts, lantern projections and specimens. It is an elementary course in Geology, and students in Geology are required to take it.

Text-book: Appleton's Physical Geography.

GEOLOGY AND PALÆONTOLOGY.

The instruction in this department is by lectures, charts, lantern projections and specimens. For admission to the class students are required to have completed the course in Physical Geography and Zoology and have studied Chemistry, and the B. S. students in addition are required to have completed the course in Mineralogy and Lithology.

Text-book: "Le Conte's Elements of Geology."

The geology of Missouri will be often discussed and its peculiar structure fully explained.

APPARATUS AND FACILITIES.

A lapidary's saw and grinding wheel for cutting and polishing specimens.

There are tables in the Laboratory arranged so that twenty-six students can easily work, and there are also twenty-five blowpipes belonging to the department. There is also one lithological microscope, a lantern and numerous slides.

The collection of rocks, fossils, ores, minerals and specimens of building stones is very large.

The total number of students in the Department of Geology and Mineralogy for session of 1890-1891 was:

Physical Geography	76
Engineering (Practical Geology)	14
Agricultural (Economic Geology and Soils)	1
Academic	33
S. B. students (Geol. and Pal.)	3
Mineralogy—regular	27
Total number in Department	154

ELECTIVE COURSE IN MINERALOGY.

JUNIOR YEAR.

First Semester—

Crystallography (5), 7 weeks.

Laboratory (2), each week.

Mineralogy, General and descriptive (5), 10 weeks.

Laboratory (2).

Second Semester—

Lithology (5), 6 weeks.

Laboratory (2).

Ores, Mines and Mining (5), 10 weeks.

Laboratory (2).

SYLLABUS OF ELECTIVE COURSE IN MINERALOGY.

JUNIOR YEAR.

First Semester—

I. Physical Mineralogy (5), 7 weeks.

1. Crystallography (5).

2. Physical properties of minerals, 2 weeks.

The lectures on Crystallography embrace a thorough discussion of the six systems of crystallization, setting forth the various forms, both simple and compound, under which the more common crystals occur; showing the constancy of angle in crystals belonging to the same species; the difference of angle in different species; symmetry in position of planes; also a discussion of the mathematical relation of crystal faces, with methods for determination of same, both by mathematical measurement and calculation, and by zones; compound or twin crystals, twining axis and twining plane; paragenic and metagenic twins; contact and penetration twins.

Irregularities of crystals will include:

a. Imperfections of surface—drusy surfaces, striated surfaces, curved surfaces, etc.

b. Variations of form and dimensions which produce misleading distortions.

c. Variations in angles produced by circumstances of heat and pressure, or by the presence of impurities at the time of crystallization.

d. Natural imperfections and impurities—coloring matter, solid and fluid enclosures; crystals considered with reference to aggregation; distinguished as variably columnar, lamellar or granular; imitative shapes in crystals, as uniform, botryoidal, mammillary, globular, etc., are shown.

Pseudomorphism among crystals discussed and illustrated; pseudomorphs by substitution, by alteration and by deposition studied.

2. The physical characters of minerals discussed are those relating to:

a. Cohesion and elasticity, as: cleavage, fracture, hardness and tenacity.

b. Mass and volume, as specific gravity, etc.

c. Light—the optical properties of crystals, color, luster, etc.

d. Heat.

e. Electricity and magnetism.

f. Action on the senses, as taste, odor, feel, etc.

II. Laboratory, from 2 to 5 p. m., Wednesdays and Fridays, during the seven weeks of Phys. Mineralogy, the work consisting in preparing from some soft material models of all the more common crystal forms, while the lectures on Crystallography last; and as supplementary to the lectures on the physical properties of minerals, the laboratory work will be preparation of transparent slides for microscopic work and microscopic study of these and numerous other sections. Students will also become familiar with the various processes for determining H., G., tenacity, etc., of minerals. Some work will be done in optical determination of minerals.

III. Descriptive and Determinative Mineralogy (5), 10 weeks.

The lectures on Descriptive Mineralogy will cover those minerals that are important:

a. In rock-making.

b. As ores of useful metals.

c. As constituting gems.

d. On account of their economic value.

IV. Determinative Mineralogy (Laboratory), from 2 to 5 p. m., Wednesdays and Fridays, for the ten weeks covering Descriptive and Determinative Mineralogy. Students, while getting a taste of determinative in course III, will continue the work to determination of unknown minerals and species.

Second Semester—

V. Lithology (5), 8 weeks.

Lectures in this course consist in a general description and classification of rocks, their origin, their history and their economic uses. A few lectures are devoted to Missouri rocks especially.

VI. Laboratory, from 2 to 5 p. m., Wednesdays and Fridays, during the eight weeks occupied by course V. The work will be practical determination of rocks, both macroscopically and microscopically, and for the latter work students will be required largely to prepare their own material in the way of thin sections, etc. Ample apparatus for such work is now in the department.

Students will also make determinations of rocks by separating them into their constituent mineral elements and determining these elements separately.

VII. Ores, Mines and Mining (5), 8 weeks.

This course of lectures, designed especially for those who have in view mine engineering as a profession, embraces all the more important ores of the base as well as the precious metals. Special lectures upon Missouri ores.

VIII. Laboratory from 2 to 5 p. m., Wednesdays and Fridays during course VIII. This work is a continuation of course VI, supplemented by a few assays of Missouri ores.

ELECTIVE COURSE IN GEOLOGY.

SENIOR YEAR.

First Semester—

Physiographic and Lithological Geology (5), 1 week.

Dynamical and Structural Geology (5), 5 weeks.

Occasional geological excursions.

Applied (Economic) Geology (5), 9 weeks.

Missouri ores (5), 2 weeks.

Additional special laboratory work (2).*

Suitable fees will be charged for use of material and apparatus.

Second Semester—

Historical Geology and Palæontology (5), to end of April, with two additional hours in laboratory, and occasional field work.

SYLLABUS OF ELECTIVE COURSE IN GEOLOGY.

Physiographic Geology will include discussion of form and feature of the earth; its physical changes due to atmospheric agents, to aqueous agents and to temperature. Trend of mountain ranges; effect of erosion, transportation of sediments, distribution of forests and faunal regions.

Lithological Geology, definition of minerals, of rocks, whether organic or inorganic; rock-forming minerals, classification of rocks, sedimentary rocks, crystalline rocks, igneous rocks, volcanic, plutonic, metamorphic rocks illustrated by specimens.

* N. B.—Two hours as put here means the equivalent of two recitations, and is really five hours in laboratory.

DYNAMICAL GEOLOGY.

Glaciers, icebergs, limit of drift in United States. Chemical agencies of water, including springs, mineral springs, formation of caves, deposits in springs, whether of lime, silica, iron oxide. Deposits in lakes, how salt lakes are formed; alkaline lakes; organic agencies; formation of peat, of coal, of bog iron, corals and coral reefs; geographical distribution of organisms, volcanoes, geysers; theories concerning earthquakes; elevation and depression of earth's surface.

Hydrothermal fusion, formation of crystalline rocks, anthracite coal.

Structural Geology—General formation of earth; its crust, density. The earth a solid mass; laws of continental form; stratified rocks defined and classified, are consolidated sediments; their first and present position; folds, fractures, faults, dip, strike, axes, conformity of strata, cleavage structure, concretionary structure.

Igneous Rocks—classification of. Plutonic rocks, granite, trap rocks, eruptive rocks, acidic and basic rocks, types of each mode of occurrence of igneous rocks; dikes, lava sheets, remarkable ancient lava flows, laccoliths; origin of igneous rocks, metamorphic rocks, theory of their formation, local metamorphism, general metamorphism.

Structures common to all rocks, fissures, joints, faults, law of slip.

Mineral veins, different kinds of, how formed, theories of accumulation of ores, the gangue, the veinstuff.

Economic Geology—Substances used in the arts; clays for brick, potter's clay, paint stuff, building stones, road material, limes, cements, useful metals, mineral, fuels, etc.

Classification of soils; how soils are formed and reclaimed, fertilizers, mineral fertilizers, water supplies.

Missouri ores, what they are and where found; their geological position and distribution and their related minerals, glass, sand, etc.

HISTORICAL GEOLOGY AND PALÆONTOLOGY.

General classification of strata; ditto of Missouri rocks, their character and distribution; principles of palæontology, definition of fossils and their uses; classification of plants and animals as adapted to fossil organic remains; description of chief palæozoic forms of life, their advent, culmination, decline or extinction; fucoids, archozoans, carboniferous flora and formation of coal; distribution and area of coal fields; animal life, protozoa, coelenterata, corals, echinodermata, crinoidia, crustacea, brachiopoda, lamellibranchiata, cephalopoda, etc., vertebrate fauna, various types, entrance, culmination, decline; the life of each geological period described; age of various mountain systems, how and when formed; Appalachian system, Alpine system, Ozark uplift.

The whole is supplemented by occasional lectures and notes of new discoveries, with occasional stereopticon views, and, when the weather is suitable, by geological excursions in the neighborhood.

THE MUSEUM.

Prof. BROADHEAD, Curator of Geological and Mineralogical Collections.

XIII. SCHOOL OF BIOLOGY.

Professor PURINTON—W. R. DODSON, Assistant.

A. BOTANY.

In the prescribed course in Science, Botany occupies three terms. Descriptive Botany is studied during the second term of the first preparatory year, the work being designed and arranged especially with a view to cultivating the powers of close observation and accurate description of natural objects. Attention is given to plants as well as to the text-book, and each student is required to observe for himself their form, habits, actions and the arrangement of their parts, and to compare them carefully with each other. Text-book: Gray's School and Field Book of Botany.

After students have acquired an elementary knowledge of chemistry and other branches of Science, the study of Systematic and Economic Botany is taken up in the second term of the Junior year. The work of this term consists principally in studying the characteristics of the different orders of plants, their relations to each other, and the leading facts in plant anatomy and physiology. The instruction is given by lectures, supplemented by means of living plants from the University green-house, objects from the herbarium and museum, and charts, drawings, photographs and lantern projections prepared in the department.

Plants are also studied with especial reference to their economic relations, and their value in the arts and manufactures.

The last part of the semester is given to the analysis and classification of plants, with the use of Gray's Manual, and to the preparation of herbaria by the class, illustrative of the work done.

During the Senior year the students spend the afternoons of Friday and Saturday of the first term in the Botanical Laboratory.

A large part of the work in the laboratory consists in the study of the minute structure of plants, Vegetable Histology and Cryptogamic Botany by the use of compound microscopes, with which the laboratory is supplied. The student here learns the use of the instruments, makes microscopic measurements and permanent mounts, and does original and independent work.

To cover the expense of material used in the laboratory, a fee of three dollars is charged on enrollment.

In the course in Agriculture, special attention is given to the study of rusts, smuts, mildews, the microscopic fungi, and plant diseases in general.

In the Engineering course about one-third of a term is given to the study of the uses, strength and durability of the different timber-producing plants.

Post-graduate students in this department will find ample opportunities for special work.

Instruction in Entomology is given by a course of lectures, for which the collection of insects in the department affords a valuable means of illustration.

Especial prominence is given to the life history and habits of insects injurious to vegetation, and the methods of successfully checking their ravages.

In addition to the above required course, the following are presented to the choice of the student :

ELECTIVES IN BOTANY.

Year.	Course.	Term.		Hours per week.
Senior.	A. B.	2	Cryptogamic Botany, or Vegetable Histology and Practical Exercises.....	3
	L. B.	2	Cryptogamic Botany, or Vegetable Histology and Practical Exercises.....	3
	S. B.	2	Cryptogamic Botany, or Vegetable Histology and Practical Exercises.....	3
Junior.	A. B.	2	Structural and Physiologic Botany.....	3
	L. B.	2	Structural and Physiologic Botany.....	3
	S. B.	2	Structural Botany.....	1

Students from other approved schools presenting satisfactory evidence that they have thoroughly completed Gray's School and Field Book of Botany, and classified correctly and mounted a suitable number of plants, will be admitted to the class in Economic and Systematic Botany without examination.

B. ZOOLOGY.

During the first term of the second year there is a course of instruction in Elementary Zoology upon three days in the week. As this class is large, there are several sections. Text-books: Packard's Briefer Course in Zoology and Colton's Practical Zoology.

During the fifth semester, Dr. Conoway, of the Medical school, gives a course of lectures in Human Anatomy, Physiology and Hygiene.

During the first term of the Junior year there is a course of lectures in Vertebrate and Invertebrate Zoology, embracing descriptive and comparative Anatomy and Physiology of the classes and orders of the animal kingdom. For admission to this class the students are required to have completed the courses in Human Anatomy and Physiology and Elementary Zoology. Reference book, Packard's Hand-book of Zoology.

Students in Zoology are required to spend one afternoon of each week for one semester in the Zoological Laboratory. The course in Laboratory practice for the first-year students embraces Invertebrate and Vertebrate dissections. Reference book, Colton's Practical Zoology.

The Laboratory course for students of the advanced class will consist of vertebrate dissections, injecting of tissues and studies in the minute anatomy of animal forms with the microscope. The laboratory fee for each student in Elementary Zoology is *one dollar*, to be paid upon entering the class. The Laboratory is supplied with microscopes and accessories for work in Histology.

The advanced students in Zoology are required to pay a fee of *two dollars*, and also make a deposit of *eight dollars* for each semester, which will be returned, less

breakage or damage done by the student, at the end of the year. All deposits and fees must be paid at the beginning of the semester.

Facilities for post-graduate work in Zoology are provided.

ELECTIVES IN ZOOLOGY.

Year.	Course.	Term.		Hours per week.
Senior.	A. B.	1	Biological Laboratory.....	2
	L. B.	1	Biological Laboratory.....	2
	S. B.	1	Embryology.....	1
Junior.	I. B.	1	Embryology.	1
	S. B.	1	Embryology, 1, } Zoological Laboratory, 2, }	3
	S. B.	2	Ornithology, or Osteology, with practical exercises	5

The number of students in Biology during the session of 1890-91 was 233.

Students having satisfactorily completed the above course in Elementary Zoology in other approved schools are, upon the presentation of the proper evidence to that effect, admitted to the Advanced class without examination.

No. of elective students in Biology for the year, 22.

Facilities will be afforded for post-graduate work for those desiring it.

THE MUSEUM.

Professor PURINGTON, Director and Curator.

The new Museum occupies the north half of the new west wing of the Main building. Its inside dimensions are 45 by 70 feet, and consist of the ground floor and four galleries—making one large and magnificent room. It is 59 feet high, well lighted by ten windows on each floor, and a large sky-light reaching the length of the well. It has a capacity of 950 longitudinal feet of upright cases, 480 feet of continuous table cases around the well, forming the balustrade, and 600 square feet of other flat cases, besides the space in the center of the ground floor. Attached to the Museum are suitable lecture and work rooms and laboratories.

The Geological and Mineralogical cabinet, of which Prof. G. C. Broadhead is curator, are partially accommodated in the Museum at present, and it is designed that they shall all eventually occupy space in connection with the other collection of natural history.

The present collection, although embracing many and costly specimens, is entirely inadequate to the needs of the Department, and should be largely supplemented by the addition of other animal forms from our own and foreign countries.

In the selections of the specimens already obtained, the primary object has been their value in teaching Systematic and Structural Zoology, and Comparative Anatomy. Out of so many interesting forms attention might be called to a group of gorillas—which approach so nearly to the form of man—and to the skeleton and stuffed skin of “Emperor,” one of the largest of the Indian elephants.

It is especially desirable that a complete classified collection of the insectivorous and other birds of Missouri and of the injurious and beneficial insects of the State

be made, and this the professor in charge and his assistant propose to do, if a sufficient sum for this purpose and to provide the necessary cases for their protection shall be appropriated.

Another imperative need is suitable heating facilities for the Museum, that it may be available for class use, and for the inspection of visitors during the whole year, which is now impossible in the winter months.

The professor in charge has already added a considerable number of stuffed and mounted specimens (the result of his own work in Taxidermy) at a comparatively nominal expenditure, which, in the market, would cost several hundred dollars. He proposes, in like manner, to largely increase the collections, should suitable facilities be provided by the proper authorities.

A large number of superior lantern slides for use in several of the schools of the University have been prepared in the Department during the past year, and serve as a very valuable means of illustration in the several departments where they are in use.

Additions are gradually being made to all the scientific collections of the University.

SUMMER COURSES IN BIOLOGY.

GEO. D. PURINTON, Ph.D., Professor.

These courses continue till through the month of July and will include lectures, class-room drill and laboratory practice in I Botany, and II Zoology, and are especially adapted to teachers and others, whose engagements forbid their attendance upon such instruction during the regular scholastic year.

I. BOTANY.—The course in Botany embraces instruction in the leading facts of plant description, Morphology and Physiology, and especial emphasis is placed upon Plant Fertilization and Reproduction.

The differences between the Phænerogams and Cryptogams, and their method of reproduction, are clearly pointed out, and a considerable time devoted to such cryptogams as the Ferns, Fresh Water Algæ, and Microscopic Fungi (rusts, smuts and plant diseases in general).

The course includes practical work in the Laboratory, and a study of general microscopical methods, which are rendered especially effective by means of the admirable equipment of microscopes, sliding apparatus, and other accessories belonging to the Department.

Reference books: Gray's School and Field Book and Gray's Manual of Botany, Bessey's Botany and Sachs' Text-book of Botany.

II. ZOOLOGY.—The course in Zoology embraces a discussion of the leading features of animal Anatomy and Physiology, Embryology and Microscopical Methods. Instruction is given by means of lectures and reference works, copiously illustrated by means of drawings, charts and lantern views of the different objects studied, and the large number of preserved animal forms in the University Museum. Practical work in the Laboratory includes simple dissections, and work with the microscope in animal tissues, and a study of the best methods of sectionizing, staining, and preserving permanent mounts. The course also embraces a number of illustrated lectures on injurious insects and the means of their extermination. When desired, instruction is also given in Taxidermy, or the stuffing, mounting and preservation of birds and mammals, the student being required to buy his own materials for work, which are very inexpensive.

Reference books: Sedgwick & Wilson, Packard, Whitman, Kingsly, Colton, Huxley and Martin.

Any student completing the above courses, or one of them, is given full credit for the same in his grades in the University, should he so desire, upon studying for a degree.

Tuition for either course, or for both combined, is \$10, with a very small additional fee for material used in the Laboratory.

Good board can be obtained in Columbia for from \$3 to \$4 per week.

LADIES' DEPARTMENT.

Mrs. J. P. ROYALL, Principal.

Almost twenty years ago the Legislature of Missouri opened the doors of our State University to young women. For some years the number who had the courage to accept the offer was small; but year by year the department has grown. Parents and daughters have wisely estimated the extraordinary advantages, both educational and financial, to be found in the University. To-day the department outranks in numbers, perhaps any female college in the West. And, in point of higher educational advantages and the expense necessarily attendant thereupon, the State University, with her able Faculty and large resources, must certainly head the list of schools desirable for the daughters of Missouri. There is no longer a special "course for girls." Our young women have equal advantages with the young men. It is conceded, too, that their class record is quite equal if not superior to that of the young men. The old objections to co-education can no longer be urged. Every provision is made which health, comfort, convenience or propriety could demand. A lady principal is provided, whose chief duty is to chaperone the young ladies connected with the University, while at all times she cordially gives to them the counsel and sympathy of a friend.

The cheerful conformity of the young ladies to all the rules pertaining to their special department, together with their uniform kindness and consideration, has made our association a pleasure and not a burden. As a rule, they have been quiet and lady-like in their demeanor, bearing themselves with a modesty and dignity which should be an encouraging evidence to the State of the great benefit bestowed upon the country in the impetus thus given to the development of genuine womanhood.

UNIFORM.

It is desirable, for many reasons, that the dress of the young women be simple and inexpensive. Simplicity in dress, right in itself, is peculiarly becoming in a student, for it saves time, money and thought to be consecrated to higher uses. It is desirable also that the young women identified with the University be distinguished from all others, and that distinction in the class-room between the rich and the poor be avoided. By the adoption of a uniform this can be readily and effectively accomplished. Therefore, to avoid extravagance on the part of some and embarrassment on the part of others, and to disarm criticism, all young ladies attending the University are required to adopt, as their daily attire (the weekly and special holidays excepted), the following uniform: A walking suit of black

woolen goods, with trimmings of the same color. During the first month of the first semester and the last month of the second semester, a white waist or basque may be substituted for the black waist or basque. The shape and material of the hat are determined by the taste of the wearer; the color and trimmings must be uniformly black.

The trimmings must be characterized by simplicity, and all flowers, feathers and ornaments are excluded from the uniform hat.

Each young woman must be provided with a water-proof cloak, with an umbrella and with rubber overshoes. In winters of this climate, it is imperative that our lady students take every necessary precaution toward the preservation of their health.

The above regulation dress is prescribed by the Faculty, and made a condition of admission or continuance in the institution, under the special authorization of the Board of Curators, and a penalty of ten demerits is entered for each day's violation of this rule; and it will be borne in mind that 100 demerits exclude the student from the institution, and 25 debar from all public appearance in the Literary Society exhibitions or contests.

LITERARY SOCIETY.

The young women have one literary society, the Philalethean. The young ladies of the more advanced classes have a larger representation in the Philalethean Society this year than ever before in its history; and the exercises of its last open session, especially the original exercises—the addresses, orations and essays—were pronounced by competent judges as very creditable.

Through the late magnificent additions made to our University, the Philalethean Society was provided with a larger and more convenient hall. Their hall can be lighted by either gas or electricity, is carpeted and handsomely but inexpensively furnished, and is one of the most commendable for good taste in the State. These generous provisions have very naturally stimulated the girls to greater interest in society work, and their membership is steadily on the increase.

The young ladies are provided also with a neatly furnished study hall communicating with the lady principal's private room, and also with convenient dressing room and cloak room. These rooms all lie together on the first floor of the east wing, and make a genteel and admirable suits for the convenience and comfort of the young ladies. They have free access to the Library, also, as Study hall.

A Young Woman's Christian association has recently been established in the University. There are already thirty active members, and eight associate members. The girls are doing zealous and earnest work, which with divine blessing cannot fail to produce a rich harvest.

SCHEME OF ACADEMIC STUDIES.

In the two Preparatory years more especial stress is laid upon English and Mathematics as the common basis of all higher education. Scarcely less importance is assigned to the Doctrine of Scientific Description represented by Physiology, Botany, Physical Geography, Physics.

The Freshman year offers the student a choice of one of three curricula—the Classical leading by steady pursuit of Latin and Greek to the degree of A. B.; the Literary through English, French and German to the degree of L. B.; the Scientific to that of S. B. (Artium, Literarum, Scientiarum—Baccalaureus-a.) The collateral studies are throughout carefully arranged to secure breadth of thought and variety of discipline, while the common elements, especially in English and Mathematics, are trusted to conserve a needed sympathy among the educated, as well as a general solidarity of culture.

On arriving at the Junior year the student must choose some one line of study for more special prosecution; this choice will be expressed in the option of electives, and there are three rules for its guidance:

1. Election each semester must be made from among the electives offered in that semester.

2. In all four semesters at least one subject must be elected from the same school—the other subjects remaining at will.

3. Electives are open to Juniors and Seniors only, except by special Faculty dispensation.

The first rule may suffer two exceptions:

a. Classical Seniors may elect either French or German, but not both.

b. Scientific Seniors may elect either Greek or Latin, but not both.

It is thought that the scheme presented, while not in any case unduly narrowing the range of intellectual attainment or sympathy, will make sure a high degree of thoroughness in elect branches.

PREPARATORY COURSES—CONDITIONS OF ADMISSION.

The full course of study pursued at the University as preparatory to the Freshman class is outlined below.

This schedule of sub-Freshman work has been arranged and adopted in the belief that it is quite within the capacity of the majority of High Schools and Academies in the State. If any such Seminary shall so far conform its own curriculum hereto as to embrace therein the full equivalent in kind and in amount (the obelized subjects excepted, as already stated) of the instruction given at the University as preparatory to the Freshman class, and shall satisfy the Academic Faculty of that state of facts, such Seminary, upon application to the University authorities, shall be enrolled and mentioned as "Approved" in the University catalogue, and its certificate shall admit the bearer to the Freshman class without examination.

Inasmuch as the Academic Faculty would gladly advance at the earliest practicable date the requirements for admission to the Freshman class, as well as remit the entire sub-Freshman work, it is respectfully recommended that High Schools and Academies include as much Latin and introduce as much Physics and Chemistry within their curricula as possible. Furthermore, since it is not disputed that the hearty sympathy and mutual support of High School and University are indispensable to the furthest advancement of their interests, both common and peculiar, it is earnestly requested that they co-operate toward this unification of the educational system of the State.

COLLEGIATE COURSES.

SENIOR.		Classical (A. B.)	Literary (L. B.)	Scientific (S. B.)
First Term.	Second Term.	I. Metaphysics 5 IV. Geology 2 V. Astronomy 3 Elective 10	Ia. French 3 I. Metaphysics 3 III. English Philology 2 V. Astronomy 3 Elective 8	I. Metaphysics 5 II. Geology 2 V. Astronomy 3 V. Geological Lab 1 Elective 9
	First Term.	I. Metaphysics 5 II. Geology 4 V. Biology 3 Elective 8	Ia. French 3 I. Metaphysics 5 II. Geology 4 Elective 8	I. Metaphysics 5 II. Geology 5 V. Biology 3 Physical Laboratory 2 V. Geological Laboratory 1 Elective 5
JUNIOR.				
First Term.	Second Term.	Ia. Greek 2 I. Botany 4 II. English 3 IV. Mineralogy 3 V. Advanced Physics 3 V. Compar Philology 2 Elective 2	I. Botany 4 II. English 3 III. Greek 3 IV. French 5 V. Advanced Physics 3 Elective 2	I. Botany 4 II. Mineralogy 4 V. Mineralogical Lab 1 Chemical Laboratory 2 V. Advanced Physics 3 Elective 5
	First Term.	Ia. Greek 3 I. Zoology 5 II. English 3 II. Latin 2 III. Chemical Philosophy 4 V. Compar. Philology 2 Elective 2	I. Zoology 5 II. English 3 III. Chemical Philosophy 4 IV. Greek 3 V. French 3 Elective 2	I. Zoology 5 II. English 3 III. Chemical Philosophy 4 IV. Mechanics 5 Elective 6
SOPHOMORE.				
First Term.	Second Term.	I. Sociology 2 II. Greek 5 III. English 3 IV. Latin 5 VI. Analytical Geom. 4 V-VII. Chemical Lab 1	I. Sociology 2 II. German 5 III. English 3 IV. Latin 5 VI. Analytical Geom. 4 V-VII. Chemical Lab 1	Ia. French 3 I. Sociology 2 II. German 5 III. English 3 VI. Analytical Geometry and Determinants... 5 V-VII. Chemical Laboratory. 2
	First Term.	I. Political Economy. 2 II. Greek 5 III. English 5 IV. Latin 5 VI. Analytical Geom. 2 V-VII. Physical Lab 1	I. Political Economy. 2 II. German 5 III. English 5 IV. Latin 5 VI. Analytical Geom. 2 V-VII. Physical Lab 1	Ia. French 3 I. Political Economy. 2 II. German 5 III. English 5 VI. Analytical Geometry and Determinants ... 3 V-VII. Physical Laboratory. 2
FRESHMAN.				
First Term.	Second Term.	I. Latin 5 II. Chemistry 5 III. Greek 5 IV. Composition and Rhetoric 2 V. Geometry and Trigonometry 3	I. Latin 5 II. Chemistry 5 IV. Composition and Rhetoric 2 V. Geometry and Trigonometry 3 VI. German 5	II. Chemistry 5 IV. French 5 V. Geometry, Trigonometry and Algebra 5 VI. German 5
	First Term.	I. Latin 5 II. Physics 5 III. Greek 5 IV. Composition and Rhetoric 2 V. Geometry and Trigonometry 3	I. Latin 5 II. Physics 5 IV. Composition and Rhetoric 2 V. Geometry and Trigonometry 3 VI. German 5	II. Physics 5 IV. French 3 IV. Composition and Rhetoric 2 V. Geometry, Trigonometry and Algebra 5 VI. German 5

PREPARATORY COURSES.

	A. B.	L. B.	S. B.
<i>First Term.</i>	I. Latin..... 5 II. Mathematics..... 5 III. Civil Government..... 3 IV. Phys. and Hygiene..... 4 V. Zoology..... 3 VII. Military Sci. or Book-keeping..... 3	I. Latin..... 5 II. Mathematics..... 5 III. Civil Government..... 3 IV. Phys. and Hygiene..... 4 VII. Military Sci. or Book-keeping..... 3	I. *Latin, Ger. or French.. 5 II. Mathematics..... 5 III. Civil Government..... 3 IV. Phys. and Hygiene..... 4 VII. Military Sci. or Book-keeping..... 3
<i>Second Term.</i>	I. Mathematics..... 5 II. Botany..... 3 III. English..... 5 IV. Latin..... 5 VII. Military Sci. or Book-keeping..... 3	I. Mathematics..... 5 II. Botany..... 3 III. English..... 5 IV. Latin..... 5 VII. Military Sci. or Book-keeping..... 3	I. Mathematics..... 5 II. Botany..... 3 III. English..... 5 IV. Latin, Ger. or French.. 5 VII. Military Sci. or Book-keeping..... 3

SECOND YEAR.

<i>First Term.</i>	I. Greek..... 5 II. Latin..... 5 IV. Mathematics..... 5 VI. English..... 5	I. English..... 5 II. Latin..... 5 III. Physics..... 3 IV. Mathematics..... 5 V. Zoology..... 3	I. English..... 5 II. Latin, Ger. or French.. 5 III. Physics..... 3 IV. Mathematics..... 5 V. Zoology..... 3
<i>Second Term.</i>	I. Greek..... 5 II. Latin..... 5 III. Physical Geography... 5 IV. Mathematics..... 5	II. Latin..... 5 III. Physical Geography... 5 IV. Mathematics..... 5 VI. U. S. History and Am. Literature..... 5	II. Latin, Ger. or French.. 5 III. Physical Geography... 5 IV. Mathematics..... 5 VI. U. S. History and Am. Literature..... 5

NOTE.—The Roman numerals denote the hour at which the class recites; the Arabic numerals denote the number of times per week.

*Those who elect two years of German or French in the preparatory science course, in place of Latin, will be excused from German or French in the University course, but must elect an equivalent, approved by the Faculty.

LIST OF APPROVED SCHOOLS.

The following schools have been approved, and their certificate will admit the bearer to the Freshman class without examination:

Name of school.	Location.	Name of school.	Location.
Bethany High school.....	Bethany.	Mexico High school	Mexico
Cooper Institute	Boonville	Mound City High school	Mound City.....
Craig High school	Craig.....	Mountain Grove academy.....	Mountain Grove
Hannibal High school.....	Hannibal	Neosho High school	Neosho.....
Higginsville High school	Higginsville	Nevada High school.....	Nevada.....
Hooper Institute.....	Clarksburg	Richmond High School.....	Richmond.....
Independence High school	Independence...	Salem High school.....	Salem
Joplin High school.....	Joplin.....	Sedalia High school	Sedalia.....
Kemper Family school.....	Boonville	St. Joseph High school	St. Joseph
Macon High school.....	Macon.....	St. Louis High school.....	St. Louis.....
Marshall High school	Marshall.....	Wentworth academy.....	Lexington.....
Maryville High school.....	Maryville	(23)	

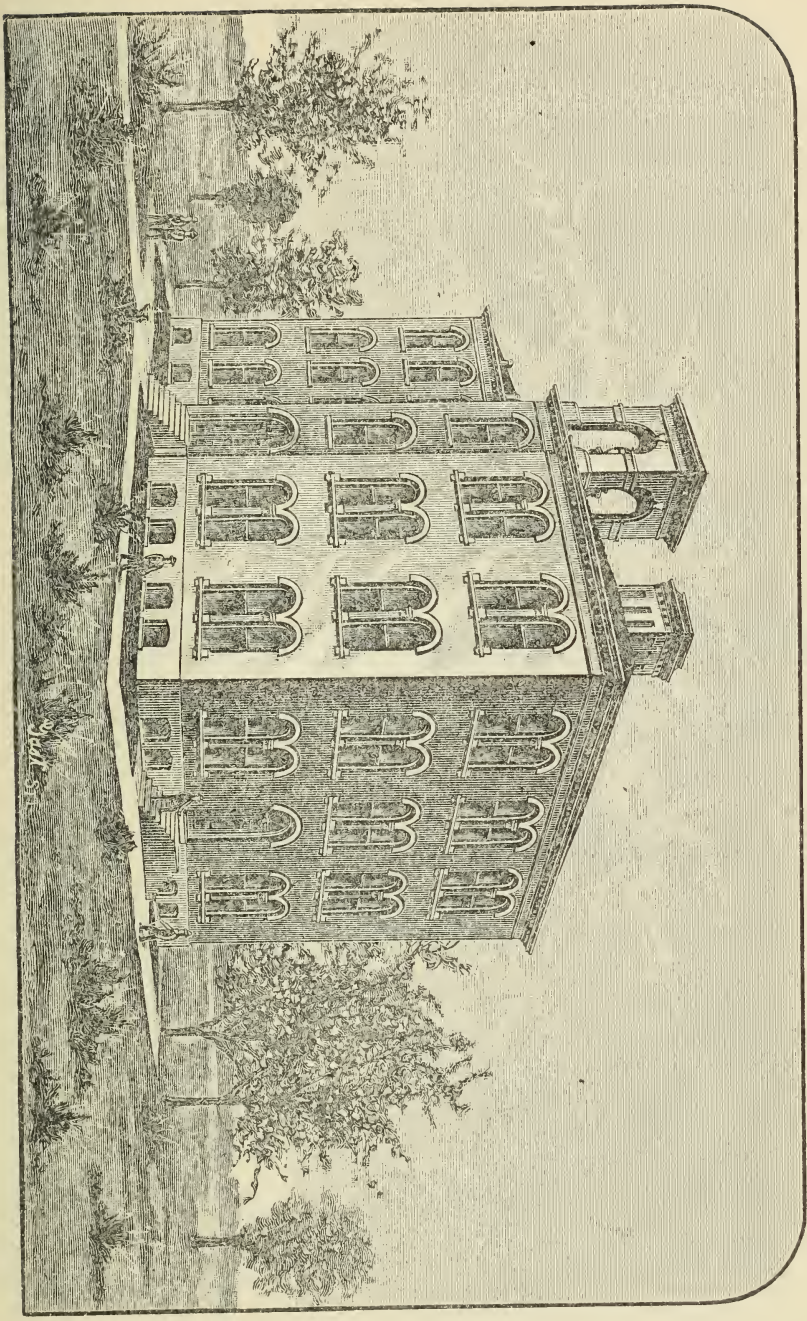
II. THE PROFESSIONAL SCHOOLS

OF THE

UNIVERSITY OF MISSOURI.

- XIV—1. COLLEGE OF AGRICULTURE AND MECHANIC ARTS.
- XV—2. PEDAGOGICS—NORMAL SCHOOL.
- XVI—3. LAW SCHOOL.
- XVII—4. MEDICAL SCHOOL.
- XVIII—5. SCHOOL OF MINING AND METALLURGY.
- XIX—6. ENGINEERING SCHOOL.
- XX—7. SCHOOL OF MILITARY SCIENCE AND TACTICS.
- XXI—8. SCHOOL OF ARTS.
- XXII—9. COMMERCIAL SCHOOL.

COLLEGE OF AGRICULTURE.



ANNOUNCEMENT

OF THE

Faculty, Courses of Study and Methods of Instruction

IN THE

COLLEGE OF AGRICULTURE
MECHANIC ARTS AND MILITARY SCIENCE

OF THE

UNIVERSITY OF MISSOURI.

COLUMBIA, MO.:
1891-1892.

COLLEGE OF AGRICULTURE, MECHANIC ARTS
AND MILITARY SCIENCE.

FACULTY.

R. H. JESSE, President of the University,
Ex officio Chairman of the Faculty.

EDWARD D. PORTER, A. M., Ph. D.,
Dean and Professor of Theoretical and Practical Agriculture.

PAUL SCHWEITZER, Ph. D.,
Professor of Chemistry.

THOMAS JEFFERSON LOWRY, S. M., C. E.,
Professor of Engineering.

PAUL PAQUIN, M. D., V. S.,
Professor of Veterinary Science.

EDWARD A. ALLEN, Litt. D.,
Professor of English.

WILLIAM B. SMITH, A. M., Ph. D.,
Professor of Mathematics.

GEORGE D. PURINTON, A. M., Ph. D., M. D.,
Professor of Botany, Entomology and Zoology.

G. C. BROADHEAD, M. S.,
Professor of Geology and Mineralogy.

W. H. ECHOLS, B. S., C. E.,
Professor of Engineering in School of Mines—Rolla.

JOHN P. ROYALL,
Professor of Book-keeping.

JOHN W. CLARK, B. S.,
Professor of Theoretical and Practical Horticulture.

M. L. LIPSCOMB, A. M.,
Professor of Physics.

Lieutenant B. B. BUCK,
(Detalled from the Regular Army),
Professor of Military Science and Tactics.

ALEXANDER MARTIN, A. M., LL. D.,
Lecturer on Agricultural Law.

C. W. MARKS, B. E.,
Superintendent of School of Mechanic Arts.

*.....
Professor of History and Political Economy.

J. P. BLANTON, A. M.,
Professor of Theory and Practice of Teaching, and Mental and Moral Science.

* To be filled by the opening of the University year.

THE AGRICULTURAL EXPERIMENT STATION.

BOARD OF CONTROL.

The Curators of the University of Missouri.

EXECUTIVE BOARD OF THE UNIVERSITY.

HON. G. F. ROTHWELL, HON. B. M. DILLEY, HON. J. S. CLARKSON.

ADVISORY COUNCIL.

The Governor of the State.

The President of the Board of Curators of the State University.

The Master of the State Grange.

The President of the State Board of Agriculture.

The President of the State Horticultural Society.

The Secretary of the State Horticultural Society.

The Professor of Agriculture, Missouri Agricultural College.

The Professor of Chemistry, Missouri Agricultural College.

The Professor of Veterinary Science, Missouri Agricultural College.

The Professor of Horticulture, Missouri Agricultural College.

The Professor of Geology, Missouri Agricultural College.

OFFICERS OF THE STATION.

EDWARD D. PORTER.....	Director and Agriculturist.
P. SCHWEITZER.....	Chemist.
PAUL PAQUIN.....	Veterinarian.
J. W. CLARK.....	Horticulturist.
H. J. WATERS.....	Assistant Agriculturist.
PAUL EVANS.....	Assistant Veterinarian.
CHARLES P. FOX.....	Assistant Chemist.
A. C. VANDIVER.....	Farm Superintendent.
IRVIN SWITZLER.....	Secretary.
R. B. PRICE.....	Treasurer.

THE COLLEGE OF AGRICULTURE, MECHANIC ARTS AND MILITARY SCIENCE.

INTRODUCTION.

This college had its origin in the beneficence of national, state and local governments. Its location, objects and aims are defined in the following extracts from the acts of Congress and the laws of the State of Missouri:

Its leading objects shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the legislatures of the states may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life. (Act of Congress, 1862, Sec. 4.)

There is hereby established the Agricultural and Mechanical College, and a School of Mines and Metallurgy, provided for by the grant of the Congress of the United States, as a distinct department of the University of the State of Missouri. (Revised Statutes of Missouri, Sec. 8738.)

To effect the said leading objects of the colleges, as herein established, it is provided that the students and members thereof shall be admitted to the libraries, museums, models, cabinets and apparatus, and to all lectures and instructions of the University, which now exist or may hereafter exist, and to all other rights and privileges thereof, in a manner as full and ample as are the students of any other department in said University; and to provide for instruction in military tactics, as herein required, it is enacted that in case a system of military education shall be established by Congress, the State University is hereby required by law to make the necessary provision for carrying out the plan so established in connection with the institution. (Revised Statutes, Sec. 8741, p. 2017.)

The Agricultural and the Mechanical College, and the School of Mining and Metallurgy herein provided for, shall have each a separate and distinct faculty, whose officers and professors may be the same in whole or in part as the officers and professors in other colleges and departments of the University. (Revised Statutes of Missouri, Sec. 8742.)

In consideration of the permanent location of the Agricultural and Mechanical College in connection with the State University, the county of Boone shall donate not less than thirty thousand dollars in cash, to be used in erecting such buildings and making such improvements as may be needed for such college, and also for a Mechanical College in connection with the State University, and that the same shall be held for the uses and purposes of said Agricultural and Mechanical College. (Revised Statutes of Missouri, Sec. 8744.)

In accordance with the above provisions, the citizens of Boone county made a donation of ninety thousand dollars for the erection of necessary buildings and the purchase of lands for an experimental farm, and this college was permanently located at Columbia, in connection with the University of Missouri and the School of Mines and Metallurgy at Rolla, under the same control and supported from the same congressional appropriations.

ENDOWMENT OF THE COLLEGE.

The support of the College is derived from :

1. The proceeds of the sales of the public lands donated to Missouri by the act of Congress of July 2, 1862. This State received as her share two hundred and seventy-five thousand acres, of which there have been sold up to date two hundred and sixteen thousand seven hundred and sixty acres, yielding three hundred and twelve thousand dollars, which sum is invested in a State certificate of indebtedness, at five percent., yielding fifteen thousand six hundred dollars; of this amount one fourth, or three thousand nine hundred dollars, is by law appropriated to the support of the School of Mines and Metallurgy, at Rolla.
2. The annual appropriations from the United States treasury by the act of Congress of August 30, 1890, of fifteen thousand dollars for the years 1889-90, and increased each year by one thousand dollars, until it reaches twenty-five thousand dollars, which shall remain an annual appropriation. Of this amount, one-sixteenth is by law appropriated to the "Lincoln Institute," at Jefferson City, for the education of negro children in Agriculture and Mechanic Arts, and one-fifth of the balance to the School of Mines and Metallurgy, at Rolla.
3. The act of Congress of March 2, 1887, known as the "Hatch bill," appropriates fifteen thousand dollars annually to the College of Agriculture, for the purpose of conducting investigations and experiments in various lines of work connected with Agriculture. By the acts of Congress making the above appropriations, the expenditures are expressly restricted to the purposes of instruction, illustration and original scientific investigations in Agriculture, and not one dollar can be used for the erection or repair of buildings; such facilities are to be provided by the State of Missouri.
4. The College building and Experimental farm, donated by the citizens of Boone county, and costing originally ninety thousand dollars.

The above sums, together with the assistance derived from the association of the College of Agriculture with the University, furnish an abundant income for all purposes of instruction and experimentation.

LOCATION.

The College of Agriculture, Mechanic Arts and Military Science is located at Columbia, Boone county, in the north central portion of Missouri, one of the most beautiful towns of the State, containing about four thousand inhabitants, noted for their culture, refinement and morality, and surrounded by a region of country of well-known healthfulness and fertility.

Columbia is connected by a branch of the Wabash Western railroad, with Centralia, whence it is accessible from all portions of the State by the Wabash and the Alton systems of railways.

GENERAL INFORMATION.

Applicants for admission to the College of Agriculture, should read carefully and follow the directions for new students given on a following page. The Dean of the College will be found in his office in Agricultural hall at the opening of each semester, from 9 to 12 o'clock, to assist students in their examinations, to direct them to suitable homes, and to advise with them in reference to their classes and studies.

CONDITIONS OF ADMISSION.

Applicants for admission to the Freshman class must be not less than sixteen years of age, and must pass a satisfactory examination in reading, writing and arithmetic.

Applicants for advanced classes in the course must sustain examinations in the preparatory studies, and in all the book studies previously pursued by the

class which they propose to enter; but if they have pursued such studies in any of the high schools of the State, approved by the Faculty, or in other institutions of similar rank, they may receive credit for their standing in those institutions, upon presenting a certificate from the proper officers, showing that they have obtained a passing grade in courses of studies equivalent to those given here.

The proper dates given for examination and admission are those given in the calendar, and it is very important for students to be present and prepared to enter their classes at the beginning of the College year, as every absence from the lectures, recitations and exercises of the classes, after their work has begun, is a loss very difficult to regain.

EXPENSES.

There is no charge for tuition in this College, but there is an annual charge of \$10.00, to be paid on the entrance of the student, covering entrance fee, incidental expenses and library charges for that year.

Injury to the College property of whatever sort is charged to the author when known, otherwise to the section, class, or the entire body of students, as may seem most just in the individual case.

BOARDING.

Board in private families, with lodging, washing and fuel, may be obtained for \$3 to \$4.50 a week. Those who enter the clubs may reduce this amount to \$1.75.

The new club-houses afford accommodations for about one hundred and twenty students. The cost of board and washing to those who enter the clubs is about \$1.75 per week. The rooms are furnished with bedstead, stove, table and two chairs. Occupants are expected to furnish whatever else they deem necessary.

The members of the clubs have their own organization—president, commissary, secretary, censors, etc. They assess themselves, collect the money, buy their own provisions and regulate their own expenses.

The students of Agriculture will have the preference of rooms in the Agricultural club buildings, which are situated on the Horticultural grounds, provided application be made before the opening of the First semester, September; the charges will be paid the same as by other students.

As the accommodations of the club-houses are limited, it will be necessary for students who wish to avail themselves of these advantages to make early application for rooms, as they are frequently all engaged before the opening of the College year. The rooms are assigned in the order of application, and requests for rooms must be made to the Proctor of the University.

COURSES OF STUDY.

The Courses of Study in the College of Agriculture, Mechanic Arts and Military Science have been selected to fully meet the requirements of the acts of Congress providing for its organization, and while they are especially adapted to prepare students for the industrial pursuits of life, they are also sufficiently comprehensive, and of such a character, as to secure the mental discipline and practical experience necessary for other callings and professions, and to qualify pupils for the duties and responsibilities of American citizenship.

OUTLINE OF STUDIES.

The subjects are more fully outlined in the following pages :

AGRICULTURE.

History of Agriculture, and its development. Brief review of the chemical composition and physical properties of air and water, and their influences combined with heat and light, upon soils and vegetation. Origin, composition, and practical classification of soils; properties, treatment, and adaptation, of each kind of soil, to the various branches of husbandry; the reclamation and improvement of soils, including drainage, sub-soiling, trenching, fallowing, preparatory tillage, fencing and road-making; manufacture, preservation and application of manures; green manures, and irrigation; farm implements and machinery; production, management, and sale of the different crops of the farm; the different breeds of farm animals, their characteristics, and adaptations; breeding, rearing, feeding, and management, for different purposes; selection of farms, and their adaptation to the different branches of agriculture; location and erection of farm buildings, and their adaptation to the purposes for which they are intended; rotation of crops, general principles, and their practical application; dairying; selection of cows for milk, butter and cheese; best methods of feeding; farm and factory systems; methods of testing milk; improved implements and machinery, and methods of handling dairy products; work of the Agricultural Experiment stations, objects to be accomplished, and methods.

All the above subjects are illustrated by the equipment and work of the College farm, and the Experiment station. Pupils are required to devote a sufficient amount of time in both of these departments, to become familiar with their practical work, and to perform all the operations of the farm with facility.

BOOKS OF REFERENCE.—Morton's *Cyclopædia*, Low's *Practical Agriculture and Domesticated Animals*, Storer's *Agriculture*, Miles on *Stock-breeding*, Thomas' *Farm Implements*; *Bulletins and Reports of the Experiment stations*, and the *Herd-books of the various Live-stock Associations*.

HORTICULTURE.

The class-room instruction in Horticulture is by lectures, supplemented by written abstracts, and a discussion of the matter gone over.

The subjects treated are: Plants, their structure and the functions of their different organs, with the effect of the different conditions of the atmosphere and soil on their development; propagation of plants by seeds, cuttings, layers, buds, grafts, etc.; the nursery and its operations; forestry; fruit-growing; glass structures, their use, construction and management; market-gardening; floriculture and landscape gardening.

Students are required to devote enough time to work on the horticultural grounds to familiarize themselves with the different operations; and if they desire to make a specialty of horticulture, an opportunity is offered of working there for wages during their spare hours.

BOOKS OF REFERENCE.—Lindley's *Horticulture*, Downing's *Rural Essays and Landscape Gardening*, Loudon's *Cyclopedia of Horticulture*, the works of Warder, Fuller, Henderson and Quinn, and the horticultural reports of various states and experiment stations.

BOTANY.

This study begins with an examination of the organs of plants, after which their minute anatomy is considered. This is followed by a study of vegetable physiology, the classification of plants and vegetable products, with special reference to their agricultural and commercial uses.

The advanced course embraces a more thorough study of vegetable physiology, covering cell structure, germination, development of tissues, parasitic fungi, especially the moulds, smut, rust and other cryptogamic plants.

The instruction is given by lectures, both in the class-room and in the field, supplemented by means of living plants from the gardens and green-houses of the College, objects from the Museum, and the charts, drawings and photographs prepared in the department. Each student has the use of a superior Compound Microscope, and is taught the use of the instrument, and how to prepare and mount his own specimens.

Each student is required to provide himself with a pocket lens for field work, under the instruction of the professor in charge; the same instrument is used in the study of Entomology, and Minerology.

ENTOMOLOGY.

Instruction in this study is given by a course of lectures, aided by the collection of insects in the Museum, and by work in the laboratory, gardens and fields. Especial prominence is given to the life history and habits of insects injurious to vegetation, and the methods of successfully checking their ravages.

The importance of this study to the Agricultural interests of our country may be shown from the statement made by the Census bureau, that the ravages of insects amount to over two hundred millions of dollars annually.

ZOOLOGY.

The course of instruction in this study embraces descriptive and comparative anatomy and physiology of the classes and orders of the animal kingdom, and is given by lectures, field work and laboratory practice, at the seasons of the year most favorable for the study of animal life. In the lectures, constant use is made of the diagrams, models and specimens from the Museums, and practical dissections of some type of each class, while microscopic study is a regular portion of the laboratory work.

DRAWING AND SHOP-WORK.

The aim of the instruction in this department is not to make finished mechanics or artisans; it is not designed to be a "Trades School," but is designed, primarily, for intellectual development and discipline; and secondarily, to cultivate habits of physical training, and to make farmers' boys familiar with the tools and processes, in working wood and iron, and to give them such training as will enable them to perform with facility the ordinary mechanical operations of the farm. The course of instruction embraces:

1. Free-hand Drawing, which is taught by means of lectures and general exercises from the blackboard, from flat copies and from models. The work embraces a thorough training of the hand and eye, in outline drawing, model and object drawing and sketching from nature.
2. Mechanical drawing, including a knowledge of the use of instruments, geometric constructions, the drawing of plans, sections and elevations of proposed structures, with the various methods of representing shades and shadows, with pen, pencil and brush.
3. A course in Shop-work, embracing
 1. *Wood-working and Pattern-making*.—This course begins with a series of exercises in wood-working, each of which is intended to give the student familiarity with a certain application of a certain tool; and the course of exercises, as a whole, is expected to enable the industrious student easily and exactly to perform any ordinary operation familiar to the carpenter, to the joiner and the pattern-maker. Time permitting, these prescribed exercises are followed by practice in making members of structures, joints, small complete structures, patterns, their core-boxes, and other constructions in wood. Particular attention will be paid to the details of pattern-making.
 2. *Forging, Moulding and Foundry-work*.—These courses are expected not only to give the student a knowledge of the methods of the blacksmith, and the moulder, but to give him that manual skill in the handling of tools which will permit him to enter the machine shop and there quickly to acquire familiarity and skill in the manipulation of the metals, and in the management of both hand and machine tools.
 3. *Section of Iron-working*.—The instruction in the machine shop, as in the foundry, and at the forge, is intended to be carried on in substantially the same manner as in the wood-working course, beginning by a series of graded exercises, which will give the student familiarity with the tools of the craft, and with the operations for the performance of which they are particularly designed, and concluding by practice in the construction of parts of machinery, and time permitting, in the building of complete machines, which may have a market value.

MATHEMATICS.

This course embraces a thorough review of the principles of Arithmetic with their practical applications to the various demand of business life. Algebra, Geometry and Trigonometry are taught with their special applications to Mechanical Draughting, Mensuration, Plane Surveying and Civil Engineering. The leading objects kept constantly in view in this course are first, to impart a practical knowledge of the subjects and methods of computation used in the ordinary affairs of life; and second, to secure the discipline of the reasoning powers so essential in the advanced courses of study, and in practical life.

VETERINARY SCIENCE

Embraces an elementary and an advanced course.

The Elementary course is designed for students in the "Short course," of two years, and will be given by lectures, illustrated by plates, models, skeletons and prepared specimens of the various organs of domestic animals. This course is not designed to prepare young men for Veterinarians, but to give them such practical knowledge of the Anatomy, Physiology and Hygiene of domestic animals as will enable them to handle intelligently ordinary farm stock. The course will embrace Comparative and Human Anatomy; the ordinary diseases of domestic animals and their treatment; water supply for stock; ventilation of stables; varieties of food, their value and preparation.

The Advanced course, given during the "Four Year Course," will embrace a thorough knowledge of the study, including Anatomy and Physiology, both human and comparative; general Pathology and Histology; practical Medicine and Surgery; Animal Obstetrics; Bacteriology, and the study of contagious and infectious diseases.

ENGLISH LANGUAGE AND LITERATURE

Embraces a review of English Grammar, the origin, structure and use of the English language, including correct expression. Exercises in composition and declamation are continued throughout the entire course. A course in Rhetoric will be given, embracing the principles of argument, and the outlines of sound criticism. A course of lectures will be given on the English language and literature, with abundant illustrations from the best authors. Students are aided in the use of the libraries of the University, to which all members of the College of Agriculture have free access, and the various literary societies under the control of the students furnish an invaluable aid to young men, in perfecting themselves in Oratory and Composition.

CHEMISTRY

Includes a consideration of chemical action, with nomenclature and formulas, and a careful study of the history, manufacture, physical, chemical and physiological properties, tests and uses of the various elements and their compounds. While teaching the facts of such, it is the aim to give prominence to those which show relations and illustrate principles. Special attention is given to those substances having extended application in the arts. In addition to the usual lecture-room experiments, the student repeats, as far as practicable, all the experimental work at his private work-table.

In Chemical Analysis, each student has his stand in the Qualitative Laboratory, completely furnished with apparatus and chemicals for his own use. His work includes the analysis of more or less complex mixtures of chemicals, minerals, ores, soils, mineral waters, well waters, etc.

AGRICULTURAL CHEMISTRY

Includes a thorough consideration of the application of chemical principles to the economy of the farm; the origin and formation of soils; the classification of soils; their composition; the analysis of soils, and their adaptation to the purposes of production; the composition and use of manures; composting; chemistry of farm operations, such as plowing, fallowing, draining; chemistry of plant growth; the composition of grain and fodder plants, and their use and value as food; feeding; the chemistry of milk, butter and cheese.

GEOLOGY AND MINERALOGY.

This study includes a general consideration of the earth's features; the constitution of rocks, and the arrangement of rock masses; the order of events in geological history; the order of succession of the strata of the earth's crust; and embracing the study of building materials, decomposition of rocks, and production of soils; useful minerals occurring in veins and beds; coal deposits, and the ordinary useful mineral substances; surface geology, applied to engineering and agriculture.

Instruction in this course will be given by lectures upon Economic Geology and Mineralogy, Lithology, Physical Geology, and Geological Surveying, and illustrated by charts, lantern projections, and the large collections of rocks, fossils, ores, minerals and specimens of building stones, in the museums.

PHYSICS AND METEOROLOGY.

These subjects are taught by lectures, text-books and laboratory practice, and embrace a consideration of the laws of force and motion; the principles of the mechanical powers, and their application to the construction and use of farm implements and machinery; the movements of fluid bodies; atmospheric phenomena; the laws of heat, light, electricity and magnetism, with their application to agricultural science. After a knowledge of the fundamental principles of Physics has been obtained, students are admitted to the Physical Laboratory, where they are made practically acquainted with the construction and use of philosophical apparatus.

HISTORY AND POLITICAL ECONOMY.

These subjects are taught by lectures and recitations from standard text-books and embrace a thorough knowledge of American history, treating of the development of political principles, the growth of population, education and industries. A course of lectures will be given on general history, with special reference to the origin of American ideas and institutions and the progress of civilization.

Under the head of Political Economy will be given a presentation of subjects connected with production, distribution and consumption of wealth, with special reference to the questions of wages, profits, trade unions, money, interest, usury laws, systems of taxation and finance. Special attention will be given in this department to the principles of Civil Governments, and the study of the Constitutions of the United States and of the State of Missouri.

MENTAL AND MORAL SCIENCE.

A course of lectures will be given upon these subjects, covering the laws governing the operations of the human mind, such as the relations of Body and Mind; the senses as factors in mental life; the laws of association and memory; the nature of reasoning and practical applications, especially in the field of education.

In Ethics the aim will be to lay a foundation for systematic thought on the problem of morals. Theories of right and wrong and correct principles of action are made the means of a clear understanding of the nature of government in various forms, with special application to individual rights and duties.

A BUSINESS COURSE

Will embrace thorough and systematic instruction in Penmanship, Commercial Arithmetic and Book-keeping, with special reference to the business of the farmer and artisan. Students will be drilled in the use of the several account books, and common business forms; in folding and filing papers, and in conducting business correspondence; the object, being to lay the foundation for correct business habits and methods, so much wanted by the majority of American farmers.

FARM ENGINEERING.

As much instruction will be given in this study as will qualify the students in Agriculture to perform intelligently the operations of land surveying, levelling, the location and construction of ditches, drains, farm and country roads.

MILITARY SCIENCE.

An officer of the regular army is detailed by the War Department as Professor of Military Science and Tactics, to carry out the provisions of the act of Congress of 1862, which, in endowing this and similar institutions, stipulates that military tactics shall be taught.

All students entering this department are required to conform to the rules and regulations prescribed for the Military School, as contained in the subsequent pages of this catalogue. The requirements of this department are so adjusted as to harmonize with the regular academic work of the students.

NORMAL INSTRUCTIONS.

As numbers of young men from the industrial classes expect to engage in teaching, either as a life work or as a means of partial support during their college course, and as there is a growing demand among the farmers of our country for the introduction of the study of Agriculture in the public schools, it has been deemed advisable to establish in the College of Agriculture a chair of Pedagogics, in which will be given a course of instruction on the theory and practice of teaching, on school law and hygiene, and on school management. This course will be elective, but all students will be required to take the course in Agriculture.

MINING AND METALLURGY.

The studies in this department are outlined in the statement of that school, in another part of this catalogue.

The Studies in the College of Agriculture, Mechanic Arts, and Military Science, as above outlined, are arranged in the following courses :

1. A THREE MONTHS WINTER COURSE.

To meet the wants of a class of young men who have not the time to go to College for a regular course of study, but who desire to secure a certain amount of practical instruction, bearing upon the work of the farm, and to aid them directly in its prosecution.

The instruction in this course will be given by means of lectures and practical illustrations; text-books will not be used except for reference.

This course will cover those specific fields of the science and art of agriculture, that will have a direct business value to farmers. Fundamental principles of science, in its relation to agriculture, will be so far presented, as to reveal the laws upon which certain operations of agriculture rest, while at the same time a discussion of the world's best methods, as gained by experience, will be required; the equipment of the College, and its farm, affording some aid in the work.

There will be lectures by the teachers of Agriculture, by successful farmers, by the Professors of Horticulture, Veterinary Science, Chemistry, Botany, and by others.

This course, will be given during the months of January, February and March. Students entering it, must be at least sixteen years of age, and have a good common school education. No entrance examinations will be required, and an entrance fee of \$5.00 will cover all College expenses.

II. A TWO YEARS COURSE.

This course is designed to take young men of fair average ability, not under sixteen years of age, and with such preparation as can be obtained in good district schools of the State, and give them a sound practical training that will broaden and strengthen them as citizens of the State, while it educates them in such branches of natural science as will cultivate their tastes for industrial pursuits and develop skill in their practice.

This course embraces the First and Second years of the regular Four Years Course, and those students who have not the opportunity of continuing their studies, will find this an excellent preparation for practical life, and the introduction of the industrial feature, by devoting two hours of each day to work on the farm, in the gardens, in the work-shop or in military drill, will keep up habits of industry, physical training, and that respect for labor, which will tend to send the student back to the farm from choice and not to educate him away from it.

III. A FOUR YEARS COURSE.

This course is a two years extension of the previous course, and is designed to give young men an advanced training in the higher departments of collegiate work, and to prepare them to enter upon their avocations in life as successful farmers, superintendents of farms, engineers, veterinary surgeons, botanists, entomologists, agricultural, chemists or lecturers.

Students completing this course will be entitled to the diploma of the University, conferring upon them the degree of B. Agr.

IV. A TWO YEARS POST-GRADUATE COURSE

Is designed to give a professional training in one or more of the schools of this College, to graduates of the College or of other Colleges of the same character.

Young men completing this course and complying with the requirements for graduation, will receive the degree of M. Agr.

COURSES OF STUDY.

FARMERS' LECTURE COURSE.

(Twelve weeks.)

LECTURES ON AGRICULTURE.

Subjects: Soils, their origin and classification; tillage; farm manures and commercial fertilizers; rotation of crops; live stock; breeding and feeding; dairy farming.

LECTURES ON HORTICULTURAL CHEMISTRY.

Subjects: Study of the more important elements as applied to agriculture; chemistry of soils, their composition and relation to light, heat and moisture; physiology of plant growth; composition and feeding value of cattle food; the chemistry of the dairy.

LECTURES ON BOTANY.

Subjects: Analysis of plants; how plants grow; economic botany; smut of grains; diseases of plants and their remedies.

LECTURES ON HORTICULTURE.

Subjects: Origin of varieties of fruits, flowers and vegetables; cross-fertilization; practical work in horticulture; budding, grafting, layering; construction and management of hot-beds and cold frames; parasites and insecticides.

LECTURES ON VETERINARY SCIENCE.

Subjects: Anatomy of the leading domestic animals, illustrated by skeletons, charts and the celebrated "Azoux" anatomical models; examination of the horse for soundness; diseases of the feet, limbs, stomach and lungs; wounds and their treatment.

LECTURES ON ZOOLOGY.

Subjects: The evolution of animal life; the classification of the animal kingdom; study of the vertebrate sub-kingdom, including the muscular, alimentary, nervous and circulatory systems, and the organs of respiration, secretion and reproduction.

The lectures in the above course will begin on January 5, 1892, and will be continued daily, except Sunday and Monday, until March 25, 1892. Three lectures will be given each day, and the remaining time can be used by the student in work in the shops, laboratories, museums and libraries.

THE TWO YEARS' COURSE.

First Year.

First Term.

Elements of Agriculture.
 Practical Mathematics.
 Analysis of Language.
 American History.
 Commercial Course.
 Anatomy and Physiology.
 Shop Work, Drawing and Military Science.

Second Term.

Elements of Agriculture.
 Practical Mathematics and Algebra.
 Rhetoric.
 Ancient History.
 Commercial Course.
 Civil Government.
 Shop Work, Drawing and Military Science.

Second Year.

Horticulture.
 Geometry.
 English Literature.
 Normal Instruction.
 Elementary Chemistry.
 Elementary Physics.
 Shop Work, Drawing and Military Science.

Agriculture.
 Plane Trigonometry and Surveying.
 Botany.
 Normal Instruction.
 Agricultural Chemistry.
 Veterinary.
 Shop Work, Drawing and Military Science.

The above will constitute the "Two Years' Course," and will be preparatory to the "degree," or

THE FOUR YEARS' COURSE.

Third Year.

First Term.

Agriculture.
 Entomology.
 Spherical Trigonometry.
 Chemistry, Organic.
 Advanced Physics.
 Political Economy.
 Farm Work and Laboratory Practice.

Second Term.

Horticulture, Forestry.
 Zoology.
 Analytical Geometry.
 Chemistry, Agricultural.
 Advanced Physics.
 Psychology.
 Horticultural Work and Laboratory Practice.

Fourth Year.

Horticulture.
 Geology.
 Agricultural Engineering.
 Veterinary Science.
 Astronomy.
 Experiment Station Work.

Agricultural Engineering.
 Mineralogy.
 Civil Engineering.
 Veterinary Science.
 Ethics.
 Experiment Station Work.

THE COLLEGE YEAR.

Commences September 14, 1891, and closes with the Annual Commencement exercises, Thursday, June 11, 1892.

The year is divided into two Terms. The first Term opens September 14, 1891, and closes January 30, 1892; the second Term opens February 2, 1892, and closes June 11, 1892.

STUDY HOURS.

Recitations, lectures and practical exercises are conducted Tuesday, Wednesday, Thursday Friday and Saturday of each week, and the hours for the College of Agriculture are from 9 o'clock to 1 o'clock, and from 2 o'clock to 5 o'clock. Chapel exercises are held from 8.45 to 9 o'clock, at which all students are expected to be present.

FACILITIES FOR INSTRUCTION.

Museums, Apparatus and Farm Library.—A valuable library of farm books has been collected, to which additions are being made. In addition to the Agricultural library, the students of the Agricultural college have access to the libraries of all the associated schools.

Agricultural Museum.—Large additions have been made to this Museum of objects especially adapted to illustrate the lectures in agriculture and agricultural botany. The World's Exposition at New Orleans was the source of much valuable matter. The Museum now contains an unusually fine collection of wool and of cotton fibres, numbering about 600 specimens. These fibres represent most all civilised sections of the world. The wool fibres include the various breeds of sheep, affording as a whole, opportunity to study the influence of climate, soil and breed on wool fibre. Various fibre-producing plants are well represented, and are often accompanied by the various manufactured products. Nearly all of the woods of the State are represented by three feet of the trunk of such tree, so prepared as to show its heart and sap in the rough and under polish. The grasses of the State are represented by 125 species, collected by a graduate of the Agricultural college. In addition to the grasses of the State, the Museum contains one of the finest general collections of grasses in the country. In seeds it contains ninety Japanese varieties, 150 species of American farm seeds, and a great number of varieties of wheat, corn, oats and barley. It has 179 different grades of the milling products of wheat. It contains several hundred models of farm machinery. Sorghum and all its varied products are represented by forty-six objects. A large collection of miscellaneous materials of great value that cannot be enumerated. The list contains many woods and their products from the States of this country and from South America and Europe; also a long list of plants and their products.

In addition to these means of illustration, 318 lantern slides have been already collected of the larger number intended. These are found to be a very great aid to the lecture room.

Chemical and Physical Laboratories.—Laboratories in each of these departments are well supplied with modern appliances for illustrating lecture-room teaching.

Green-house.—A green-house, which is connected with the Horticultural Department, affords invaluable assistance in connection with the botanical studies and for the improvement of plants.

Farm.—The farm is divided into two departments—Farm and Horticultural—both of which were well equipped with buildings, stock and tools of modern character. But owing to a disastrous fire in 1889, the barn, implements and machinery were totally destroyed. They have been partially replaced, and it is hoped that necessary appropriations will be made by the next Legislature to thoroughly equip the farm for the best work. The farm consists of 700 acres of land of varying quality, and is well adapted to its purpose of instruction and experiment work. The students will be required to perform such labor on the farm as is deemed necessary for the acquirement of proficiency in the methods taught, and will be compensated according to the character and amount of the work done, ten cents being the maximum pay per hour. In addition to this field labor, students will be required to perform farm labor whenever it is desirable to illustrate lecture-room teachings. Such work will be done without pay.

Experiments will be constantly carried on for the farming interests of the State and for lecture-room work. Students will be required to assist in the experiments.

The Horticultural department will stand in the same relation to the lecture room and to the public that the farm does. It is an indispensable aid in teaching the student small fruit culture, grafting, budding, pruning, hot-house propagation, vegetable gardening, etc.

In the orchard and fruit garden are about eight hundred varieties of fruits, which are used in illustrating lecture-room work and for experimental purposes.

THE AGRICULTURAL EXPERIMENT STATION.

This Station is made by the act of Congress of 1887, and by the acts of the General Assembly of Missouri accepting its provisions, and by the order of the Board of Curators of the University of Missouri, a department of the College of Agriculture.

The following are the essential sections of the act of Congress referred to, and define clearly the objects to be accomplished in the organization of these Stations :

AN ACT to establish agricultural experiment stations in connection with the colleges established in the several States under the provisions of an act approved July second, eighteen hundred and sixty-two, and of the acts supplementary thereto.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That in order to aid in acquiring and diffusing among the people of the United States useful and practical information on subjects connected with agriculture, and to promote scientific investigation and experiment respecting the principles and application of agricultural science, there shall be established, under direction of the college or colleges or agricultural department of colleges in each State or Territory established, or which may hereafter be established, in accordance with the provisions of an act approved July second, eighteen hundred and sixty-two, entitled "An act donating public lands to the several States and Territories which may provide colleges for the benefit of agriculture and the mechanic arts," or any of the supplements to said act, a department to be known and designated as an "agricultural experiment station:" *Provided*, that in any State or Territory in which two such colleges have been or may be so established, the appropriation hereinafter made to such State or territory shall be equally divided between such colleges, unless the legislature of such State or Territory shall otherwise direct.

SEC. 2. That it shall be the object and duty of said experiment stations to conduct original researches or verify experiments on plants and animals; the diseases to which they are severally subject, with the remedies for the same; the chemical composition of useful plants at their different stages of growth; the comparative advantages of rotative cropping as pursued under a varying series of crops; the capacity of new plants or trees for acclimation; the analyses of soils and waters; the chemical composition of manures, natural or artificial, with experiments designed to test their comparative effects on crops of different kinds; the adaptation and value of grasses and forage plants; the composition and digestibility of the different kinds of food for domestic animals; the scientific and economic question involved in the production of butter and cheese; and such other researches or experiments bearing directly on the agricultural industry of the United States as may in each case be deemed advisable, having due regard to the varying conditions and needs of the respective States and Territories.

SEC. 4. That bulletins or reports of progress shall be published at said stations at least once in three months, one copy of which shall be sent to each newspaper in the States or Territories in which they are respectively located, and to such individuals actually engaged in farming as may request the same, and as far as the means of the station will permit. Such bulletins or reports and the annual reports of said stations shall be transmitted in the mails of the United States free of charge for postage, under such regulations as the Postmaster General may from time to time prescribe.

SEC. 5. That for the purpose of paying the necessary expenses of conducting investigations and experiments and printing and distributing the results as hereinbefore described, the sum of fifteen thousand dollars per annum is hereby appropriated to each State, to be specially provided for by Congress in the appropriations from year to year, and to each Territory entitled under the provisions of section eight of this act, out of any money in the treasury proceeding from the sales of public lands, to be paid in equal quarterly payments, on the first day of January, April, July and October in each year, to the treasurer or other officer duly appointed by the governing boards of such colleges to receive the same, the first payment to be made on the first day of October.

eighteen hundred and eighty-seven: *Provided, however*, that out of the first annual appropriation so received by any station an amount not exceeding one-fifth may be expended in the erection, enlargement or repair of a building or buildings necessary for carrying on the work of such station; and thereafter an amount not exceeding five per centum of such annual appropriation may be so expended.

It will be noted that the act of Congress of 1862 was designed to promote Agricultural *Education*, while that of 1887 provides for Agricultural *Investigation*.

In accordance with the provision with the above act of Congress the Board of Curators of the University of Missouri in January, 1888, reorganized the Experiment station by transferring to it the entire use of what has been known as the 'Agricultural College farm,' upon which for many years this work of experimentation had been conducted by the Professor of Agriculture of the College.

The results of these experimental investigations have been given to the public in a series of bulletins or reports, which are furnished free of charge to any one applying for the same. These bulletins are numbered from 1 to 35 of the Farm series, and 1 to 14 of the Station series, since its reorganization.

NOTICE.

Any information desired concerning the College of Agriculture or the Experiment station will be cheerfully given upon application to

EDWARD D. PORTER.

Dean of the College of Agriculture and Director of the Experiment station.

XV. NORMAL SCHOOL.

FACULTY.

* M. M. FISHER, D. D., LL. D.,
Chairman of Faculty, Lecturer on Roman Education.

JAMES SHANNON BLACKWELL, PH. D.,
Chairman of Faculty.

Professor of Pedagogics.

EDWARD A. ALLEN, LIT. D.,
Professor of English, Dean.

PAUL SCHWEITZER, PH. D.,
Professor of Chemistry.

JAMES SHANNON BLACKWELL, PH. D.,
Professor of Modern Languages, and Lecturer on Oriental and Medieval Education

WOODSON MOSS, M. D.,
Professor of Anatomy and Physiology.

WM. B. SMITH, PH. D. (Goett.)
Professor of Mathematics.

JOHN P. ROYALL,
Instructor in Book-keeping.

GEORGE D. PURINTON, A. M., PH. D.,
Professor of Biology.

G. C. BROADHEAD, M. S.,
Professor of Geology and Mineralogy.

M. L. LIPSCOMB, A. M.,
Professor of Physics.

W. G. MANLY, A. M.,
Professor of Greek, and Lecturer on Greek Education.

* Died February 20, 1891.

DEGREES GRANTED BY THE NORMAL COLLEGE.

I. Principal in Pedagogics (Pe. P.)

II. Bachelor of Pedagogics (Pe. B.)

Students are graduated in two distinct Normal courses, one academic and the other elementary.

The Elementary Normal degree (Pe. P.) is conferred upon those students who complete the "Public School" Normal course, extending over two years, and arranged to meet the requirements of the school law of the State. Graduates in this course receive a certificate, which, according to the present law, "entitles the holder to teach the several branches of study named therein for a period of two years from the date of graduation."

COURSE OF STUDY FOR ELEMENTARY DEGREE.

	JUNIOR YEAR.	No. times per week.
First Semester....	English Grammar and Analysis (Third semester)	5
	Algebra and Plane Geometry (Third semester)	5
	Physiology and Hygiene.	4
	Civil Government.	3
	Zoology..	3
Second Semester..	United States History.....	3
	American Literature.....	2
	Physical Geography.....	5
	Elementary Botany.....	3
	English Composition.....	5
	SENIOR YEAR.	
First Semester....	Chemistry	5
	English History	2
	English Literature	3
	Elementary Physics	3
	Book-keeping.....	3
	Pedagogics	3
Second Semester..	English Literature.....	3
	Laboratory (Elective).....	5
	Young Chemist.....	1
	Rhetoric	2
	Pedagogics.	3

ACADEMIC NORMAL DEGREE (Pe. B.)

The higher degree, that of Bachelor of Pedagogics, is conferred upon regular graduates of the University in any one of the three academic courses who supplement their academic work by two semesters of Normal instruction. Graduates in this course receive a diploma, which is a permanent license to teach anywhere in this State.

ENROLLMENT.

Students in the Normal class.....	22
Candidates for graduation:	
Academic degree, Pe. B.....	4
Elementary degree, Pe. P.....	14

XVI. LAW DEPARTMENT.

 FACULTY.

* M. M. FISHER, D. D., LL. D.,
Chairman of the Faculty.

JAMES S. BLACKWELL, A. M., PH. D.,
Chairman of the Faculty.

ALEXANDER MARTIN, A. M., LL. B., LL. D.
Professor of Law, Special Lecturer, (Dean of the Law Department.)

CHRISTOPHER G. TIEDEMAN, A. M., LL. B.,
Professor of Law. Special Lecturer.

JAMES A. YANTIS, LL. B.,
Professor of Law. Special Lecturer.

PAUL SCHWEITZER, PH. D.
Lecturer on Toxicology.

ANDREW W. MCALESTER, A. M., M. D.,
Lecturer on Medical Jurisprudence.

HON. JOHN HINTON, JUDGE OF PROBATE,
Lecturer on Probate Law and Practice.

HON. SEYMOUR D. THOMPSON, LL. D., JUDGE OF ST. LOUIS COURT OF APPEALS,
Lecturer on Law of Corporations.

JAMES A. SEDDON, A. M. LL. B., EX-JUDGE OF CIRCUIT COURT OF CITY OF ST. LOUIS,
Lecturer on Commercial Law.

HON. UPTON M. YOUNG, OF THE ST. LOUIS BAR,
Lecturer on Equity Jurisprudence.

* Died Feb. 20, '91.

SENIOR CLASS.

Name.	Residence.
Arnold, James D.	Columbia
Biggs, George R.	Curryville.
Brown, John S.	Edina
Burk, James S.	Huntsville.
Crews, Paul N.	Fayette
Edwards, George L.	Jefferson City
Denny, James H.	Glasgow
Evans, Lindell P.	Hallsville
Gardner, Albert E. L.	Sedalia
Grempp, Christian Van	Vienna
Gwinn, James.	Sweet Springs
Jennings, William S.	Mount Vernon.
Kane, Dennis W.	Carrollton
Keith, Charles A.	Mayview
Kemp, George W.	Salida, Col.
Littell, William R.	Fairfax
McCulloch, R. Lee.	Boonville
Manns, Arnold.	Clarksville.
Neal, James Preston.	Fayetteville, Ark.
O'Mahoney, Clarence	Columbi
Parker, Warren A.	Mexico.
Pittman, Hubert N.	Fayetteville, Ark.
Puckett, Oscar.	Mayview
Shull, Aytchmonde P.	Platte River.
Sprecker, William H.	Arcadia, Kan.
Stirling, J. Bowman.	Leland, Miss.
Warden, Hubert P.	Perry
White, Edward J.	Sulphur Springs, Ark.

JUNIOR CLASS.

Name.	Residence.
Allen, James M.	Lamar.
Barnett, James S.	Columbia
Beach, Alva W.	Helena, Mont.
Blake, Frank.	Kansas City.
Bogie, Mordcai M.	Richmond.
Chambers, John Ralph.	Pattonville
Cheney, George N., A. B.	Syracuse, N. Y.
Davis, Harry M.	Bethany.
Divelbiss, Frank P., A. B.	Richmond
Dunkin, Robt. Roy	Browning.
Farley, Robert Emmet.	Columbia
Gerig, Edward.	Columbia
Herdson, Harry T.	Platte City.
Hinkle, John I.	Boles.
Locker, Wm. H.	Esrom
Manning, Van	Tiff City
Mayfield, Irvin W.	Columbia
Mayfield, Leander Claudius	Lebanon.
McWilliams, Homer	Kansas City
Montgomery, L. on K	Bolecow
O'Donahoe, James J.	St. Louis
Poague, Henry F.	Palo Pinto.
Records, William P.	Blue Springs.
Robinson, Omar E.	Rockville
Rodgers, Robert D.	Benton City.
Ruark, Horace C.	Neosho.
Shaper, Jesse H., A. B.	Troy
Stinson, Milton P.	Kansas City
Swarner, Heckendorn.	Clarksburg
Thompson, Burton M.	Columbia
Thomson, R. Gurdon, A. B.	Slater
Tipton, Joseph C., A. B.	Las Vegas, New Mexico
Toalson, Oscar B.	Urich
Veerkamp, James P.	Mexico
Whitsett, George P.	Carthage
Willis, John S.	Columbia

SPECIAL STUDENTS.

Name.	Residence.
Cameron, John F.	Hale

UNDER-GRADUATE COURSE.

For admission to the Junior class, no examination in law is required; but the Faculty must be satisfied that the candidate is possessed of at least a common school education; and if unknown to the Faculty, he must bring testimonials of good character.

No one will be admitted to the Senior class as a candidate for a degree unless he applies at the beginning of the Senior year, and is able to sustain an examination upon the studies of the Junior year. In exceptional cases, upon failure in one or two branches only, the examination as to those branches may be postponed to some period during the term.

Students who do not wish to take the full course, and who are not candidates for the degree of Bachelor of Laws, will be permitted to take an elective course, and pursue any branches whose recitations do not interfere with each other. They will be classed as special students.

The full under-graduate course is for the term of two years, and embraces the various branches given below. Instruction is given by daily examination upon the text-books and leading cases by lectures upon special titles, and by the exercises of a moot court.

The Junior class will be instructed in the following subjects:

Elementary Law, Criminal Law, Torts, Bailments and Contracts:

By Professor YANTIS.

Law of Sales, Commercial Paper and Partnership:

By Professor TIEDEMAN.

Law of Domestic Relations:

By the DEAN.

The Senior class will be instructed in the following subjects:

Law of Real Property, Constitutional Law, Interpretation and Construction of Statutes:

By Professor TIEDEMAN.

Pleading and Practice, Equity Jurisprudence, Admiralty, Insurance, Law of Corporations, and International Law:

By the DEAN.

Law of Evidence:

By Professor YANTIS.

TEXT-BOOKS.

The text-books of the Junior year will be as follows:

Robinson's Elementary Law.

Bishop on Contracts.

Cooley on Torts.

Schouler on Domestic Relations.

Schouler on Bailments.

Tiedeman on Sales.

Pollock on Partnership.

Tiedeman on Commercial Paper.

Criminal law is taught in connection with Robinson's Elementary Law and the criminal code of Missouri.

The text-books of the Senior year will be as follows:

Tiedeman on Real Property.

Bispham's Equity Jurisprudence.

Greenleaf on Evidence, 1st Vol.

Boone on Corporations.

Cooley's Principles of Constitutional Law.
 Woolsey's International Law.
 May or Flanders on Insurance.
 Bliss on Code Pleading.
 Desty on Shipping and Admiralty.
 Desty on Federal Procedure.

The Law Faculty are more and more satisfied that the highest results cannot be reached by lectures alone, however clear and thorough they may be, but that the student should, as far as possible, be required to study the text-books and leading cases, and be examined thereon, accompanied by oral explanations by the teacher. The lecture has been combined with study, and, in subjects which for want of time and proper books cannot be otherwise taught, is relied on.

The studies of the under-graduate course will compel ordinary students, although they enter with some preparation, to take the full two years' course.

THE MOOT COURT

Is held every Friday, and is made to represent some actual court, with its clerk and sheriff; and the matters discussed arise in some supposed cause. Regular pleadings are required, and, when the cause is supposed to be in the Supreme court, in addition to the pleadings, papers are prepared, necessary in actual practice, as the writ of error, assignment of errors, bill of exceptions embodying the instructions to the jury, rulings upon the admission or exclusion of evidence, motions for new trial, or in arrest, etc. Briefs of points and authorities must also be submitted and filed. A member of the Senior class or graduate class is called to sit as special judge in each cause, who, the next week, gives his opinion in writing, subject to appeal to the presiding officer.

GRADUATE COURSE.

The Board of Curators, on the 18th of April, 1891, established a further and additional course of instruction and study in the Law Department, occupying one year, which will open at the commencement of the next year. Graduates of the Law Department are admissible to it. The graduates of other law schools will also be admitted, after satisfying the Faculty of the Law Department that the course of instruction and study for which they obtained their degree is equivalent to the course of instruction and study required for the corresponding degree given in the Law Department of this University. All who complete the course to the satisfaction of the Faculty of the Law Department will receive the degree of Master of Laws: LL. M.

The object of this course is to provide the intended practitioner with a more extended and practical knowledge of the most important subjects embraced in modern law than the limited time of the under-graduate course will admit of. It is also intended to afford him assistance in prosecuting the study of any particular subject or department of law which he expects to follow specially in his future practice.

The course of instruction will embrace lectures and recitations on the following subjects :

Constitutional Law.
 Corporations.
 Insurance.

Trusts.
 Patents.
 Law of Homicide.

The student in this course will be allowed to select any special subject in law for extended examination and study, to be prosecuted concurrently with the sub-

jects embraced in the course. His examination and study will be directed by the Faculty, who will advise him of the books and cases to consult, and afford him assistance and counsel when called upon.

It is believed that many licensed attorneys, beginning or about to begin practice, will find it to their advantage to take the instruction of this course as special students.

LIBRARY.

The library facilities have been greatly increased, and additions to it will be annually made. Students are urged in the future to make as much use of the library as possible. The professor in charge of the library will give whatever assistance may be needed in learning how to use law books, to investigate questions of law, prepare briefs, etc.

DEGREES AND HONORS.

Those of the Senior class who sustain an examination will be entitled to the degree of Bachelor of Laws; those of the graduate course sustaining examination will be entitled to the degree of Master of Laws.

Whenever a candidate for graduation attains a high degree of excellence in his class work, the degree of "Bachelor of Laws" or "Master of Laws" will be conferred upon him with distinction, and the words "*cum laude*" will be incorporated in the diploma. In determining the required degree of excellence, the student's general scholarly attainments will be considered.

Only those Seniors who shall have attained "distinction" shall be eligible to the honor of valedictorian at Commencement.

The members of the Senior class are all invited to write essays upon some subject in the law assigned to them by the Faculty at the beginning of each year. The essays so written will be submitted to a committee of judges charged with the duty of designating the best two of said essays. The best one of the two thus designated will be read by the author at Commencement exercises, and both of them will be recommended for publication. Students not writing essays as aforesaid shall not be eligible to any of the honors and distinctions heretofore mentioned as in addition to the right of graduation, unless they have been excused therefrom for good cause.

The heirs of the late Hon. James S. Rollins have provided for the establishment of a prize fund, whose interest shall be expended annually in the bestowal of a prize of fifty dollars upon the most worthy Junior in several of the colleges of the University. According to the terms of the trust, one of these prizes is to be awarded to the Junior law student who shows himself entitled thereto by his superior scholarship and moral conduct. The prize will be awarded at the Commencement following the close of the Junior year.

All who receive the degree of Bachelor of Laws are by law admitted, without further examination, to practice in all the courts of the State of Missouri.

EXPENSES.

Tuition is as follows: For the first year, \$50, payable in advance; for the second year, \$40; for the third year, \$40; for candidates for the Senior or graduate class, who have not been members of the Junior class, \$50; for candidates entering Junior class after January 1st, \$35. Boarding is had in clubs at \$2.25 per week, and in families from \$3 to \$4.50. No fee for incidentals except the fee of \$5 charged graduates for their diplomas.

The Treasurer's receipt should be at once presented to the Proctor at the University, when the name of the student will be entered upon the University roll, and a card to that effect will be delivered to him.

The student must present the card thus received from the Proctor to the Secretary of the Faculty, who will enroll his name and issue to him his matriculation ticket, with the instructions necessary for enabling him to have his name entered on class roll.

Law students have access to all the Academic departments and the library of the University without additional charge.

DISCIPLINE.

The Faculty require every student to pay strict attention to the duties assumed by him, and to be honorable and considerate in his deportment to the Faculty, fellow-students and citizens. This is the only rule of behavior, the highest penalty for violation of which is expulsion.

The Law department opens the first Tuesday in October, and closes the first Thursday in June, of each year. The next year will open October 6, 1891.

For information and catalogues, address the Dean at Columbia, Mo.

MEDICAL COLLEGE.

Organized 1845. Suspended during the civil war. Reorganized 1872.

COURSE OF INSTRUCTION.

Graded, extending through three years. The 19th annual session will commence Sept. 9, 1891, and will end June 1, 1892, continuing nine months, and being divided into two semesters.

Instruction in this school is given by lectures, recitations, clinical teaching and practical exercises, uniformly distributed throughout the two semesters.

The division of studies in the three years' course is as follows:

First Year—Anatomy, Osteology and dissecting; Physiology, chemical, nutritive; Chemistry, medical and qualitative; Normal Histology, Microscopy, with mounting and staining normal tissues; general Therapeutics.

Second Year—Anatomy, general and descriptive, and dissections; Physiology, sensory and reproductive; Analysis of Urine; Microscopy, mounting and staining bacteria; Therapeutics, Theory and Practice of Medicine, Surgery and Obstetrics.

Third Year—Theory and Practice of Medicine, Clinical Medicine, Physical Diagnosis, Surgery, Clinical Surgery; Anatomy, surgical and topographical; Obstetrics, Therapeutics, Gynecology, Diseases of Children; Diseases of eye, ear nose and throat; Sanitary Science; Medical Jurisprudence; Work in Laboratory; Bacteria.

REQUIREMENTS FOR ADMISSION.

The requirements for admission shall be the same as in the academic departments.

Students are strongly urged to take degrees in Arts or Science before entering this department. Such students will be permitted to complete the first year's work

in Osteology and Physiology while pursuing their academic studies, thus admitting them, on graduation from academic department, to the second year of the Medical Course.

In addition to the ordinary degree of M. D., we recommend the degree of "M. D. Cum Laude" to all students having the degree of A. B. or S. B.

Examinations—Students must pass in the work of each class before admission to an advanced class.

Fees—The first year's course will be placed at \$20, as it is largely accademic; second and third years, \$50 each.

FACULTY.

J. S. BLACKWELL, PH. D.,
President of Faculty.

A. W. MCALESTER, A. M., M. D.,
Dean of Faculty. Professor of Surgery and Obstetrics.

P. SCHWEITZER, PH. D.,
Professor of Chemistry and Toxicology.

WOODSON MOSS, M. D.,
Professor of Practice of Medicine and Anatomy.

PAUL PAQUIN, M. D., M. V.,
Professor of Bacteriology and Pathological Anatomy. Director of Pathological Laboratory.

GEORGE D. FURINTON, M. D., PH. D.,
Professor of Medical Botany.

M. L. LIPSCOMB, A. M.,
Professor of Physics.

J. W. CONNAWAY, M. D., D. V. S.,
Professor of Physiology (Human and Comparative)

PAUL EVANS, M. D.,
Professor of Histology and Microscopy.

SPECIAL LECTURES.

A. B. MILLER, A. M., M. D.,
Lecturer on Gynecology.

G. R. HIGSMITH, M. D.,
Lecturer on Abdominal Surgery.

N. M. BASKETT, M. D.,
Lecturer on Diseases of the Thorax.

J. J. HALLEY, M. D.,
Lecturer on Railway Surgery.

M. D. LEWIS, M. D.,
Lecturer on Practice of Medicine.

W. P. WILCOX, M. D.,
Lecturer on Diseases of Circulatory System.

The length of the session, NINE MONTHS, renders it practicable to distribute the different branches among the teachers in the most satisfactory manner, and in their natural order and succession. The student is thoroughly drilled each day by examinations upon the lectures of the previous day, and by recitations from the textbooks.

By this method of teaching, it is claimed that we avoid the process of cramming—a deleterious practice, too prevalent in the general system of medical education. We believe that the proposed method of teaching will do more to elevate the standard of medical education, and to exalt the dignity of the profession, than any other measure that could be adopted.

Besides the ordinary instruction in Chemistry, a special course is given to advanced students in Toxicology, the material and appliances for teaching which are not excelled by any institution in the United States.

The students are also taught the use of the microscope, both in relation to pathological and physiological studies. For instruction in this most important and beautiful subject, the students are arranged in classes of five each. Besides the microscope, the Department has the benefit of two superior magic lanterns. For illustrating lectures with the above instruments, there are over 500 slides.

Among the advantages offered by this school is the privilege granted without further cost to all students who enter the Medical department, of pursuing such studies as they may desire in the academic course. Or academic students may take Anatomy and Physiology in the medical course, preparatory to entering on the full medical course, after graduating in Arts and Science. Some students pursue this plan every year.

A full course of lectures is given on Medical Jurisprudence, to the combined classes in Law and Medicine. When necessary for the more complete understanding of the subject, the lectures are illustrated by the use of accurate anatomical models; and anatomical and physiological instruction is given, incidentally, for the special benefit of the law students.

This department is equipped with models in elastic and papier mache, plaster casts, drawings and other appliances for the illustration of the lectures on anatomy, surgery and physiology.

Among the many valuable preparations for demonstrating anatomy and surgery is Dr. Auzoux's Clastic Man, a complete and accurate model of the male human body. The figure is five feet ten inches in height, and is composed of ninety-two separate parts, which may be detached from one another. It exhibits over two thousand details of the viscera, muscles, nerves, blood-vessels, etc.; in short, all that is usually embraced in a complete treatise on anatomy.

Also, Auzoux's female pelvis, with the external organs of generation, the lumbar vertebræ, diaphragm, muscles, aponeuroses of the perineum, vessels and nerves.

Also, his collection illustrating Ovology. These models are on an enlarged scale, and exhibit the modification of the ovum, envelopes and vitelline vesicle, etc.

In addition to the above are eight uteri, in clastic, containing the products of conception at the first, second, third, fourth, eighth and ninth months, with examples of tubular and ovarian pregnancy.

Another model, to which we deem it proper to call special attention, is Dr. Auzoux's synthetic model of the brain, which exhibits the structure of that organ upon an immensely magnified scale. Designed in conformity with the new anatomical indications furnished by Dr. Luys, this model presents a resume of all the researches of ancient and modern anatomists. This entirely new method of studying the brain opens an immense field for the research of physicians and philosophers. The models of the eye and ear are greatly enlarged and very accurate, showing the complete gross structure of these organs, as described by modern anatomists. The preparation of the head is most admirably executed. The bones are disarticulated, and mounted according to the method of Beauchene.

Besides these invaluable models and preparations, we have a complete set of the German anatomical models, in plastic, made at Leipzig.

PRACTICAL ANATOMY.

Every facility is afforded the student for the study of practical anatomy. Adequate provision is made for a supply of subjects amply sufficient for the number of students. The dissecting rooms are large and well ventilated, and will be open during the whole winter season, where, under the guidance of the Demonstrator, the student must, by dissection, acquire a practical knowledge of the human body in all its parts.

TEXT-BOOKS, AND BOOKS OF REFERENCE.

ANATOMY—*Gray, Wilson, Leidy.*

SURGERY—*Ashurst, Gross, Erichsen.*

PHYSIOLOGY—*Dalton, Flint, Carpenter.*

PRINCIPLES AND PRACTICE OF MEDICINE—*Flint, Niemeyer, Watson.*

MATERIA MEDICA—*Bartholow, Biddle, Farquharson.*

CHEMISTRY—

OBSTETRICS—*Schröder, Playfair.*

DISEASES OF WOMEN AND CHILDREN—*Thomas, West, Smith.*

HISTOLOGY—*Frey, Rindfleisch's Pathological Histology.*

PATHOLOGY—*Virchow, Paget, Gross.*

TOXICOLOGY—*Taylor.*

OPHTHALMOLOGY—*Wells, Williams.*

OTOLOGY—*Toynbee, Turnbull.*

MEDICAL JURISPRUDENCE—*Taylor, Wharton and Stille.*

NERVOUS DISEASES—*Hammond, Reynolds.*

DISEASES OF THE HEART AND LUNGS—*Flint, Loomis, Walsh.*

CLINICAL MEDICINE—*Trousseau, Graves, Bennett.*

Every student should provide himself with a medical dictionary (*Dunglison's* is suggested). The text-books are designated by *italics*.

REQUISITES FOR GRADUATION.

1. The candidate must have completed and sustained a satisfactory examination upon the course prescribed in this school.
2. He must be twenty-one years of age, and exhibit to the Faculty satisfactory evidence of possessing a good character.
3. His last course of lectures must have been attended in this Institution.
4. He must have been regular in attendance on lectures and recitations.
5. He must have pursued the study of practical anatomy, under the supervision of the Demonstrator, during his course of pupilage in this Institution.
6. He must notify the Dean of the Faculty, privately, on or before the first week of April, of his intention to become a candidate for graduation at the ensuing Commencement.
7. Every candidate must appear before the members of the Faculty for examination in the various branches of medicine taught in this school, at the time appointed for such examinations.
8. Violation of the general laws and rules established by the Curatsrs and the Faculty for the government of the University, negligence of duties, habitual and prolonged absence from lectures and from the anatomical rooms, will prevent a student from obtaining a degree.
9. If a candidate is rejected, his graduation fee will be returned to him.

For flagrant violation of the rules and laws established for the government of the University, a professional student may be expelled from the Institution. In such a case, the fees on his entrance will not be returned to him.

PURCHASING TEXT-BOOKS.

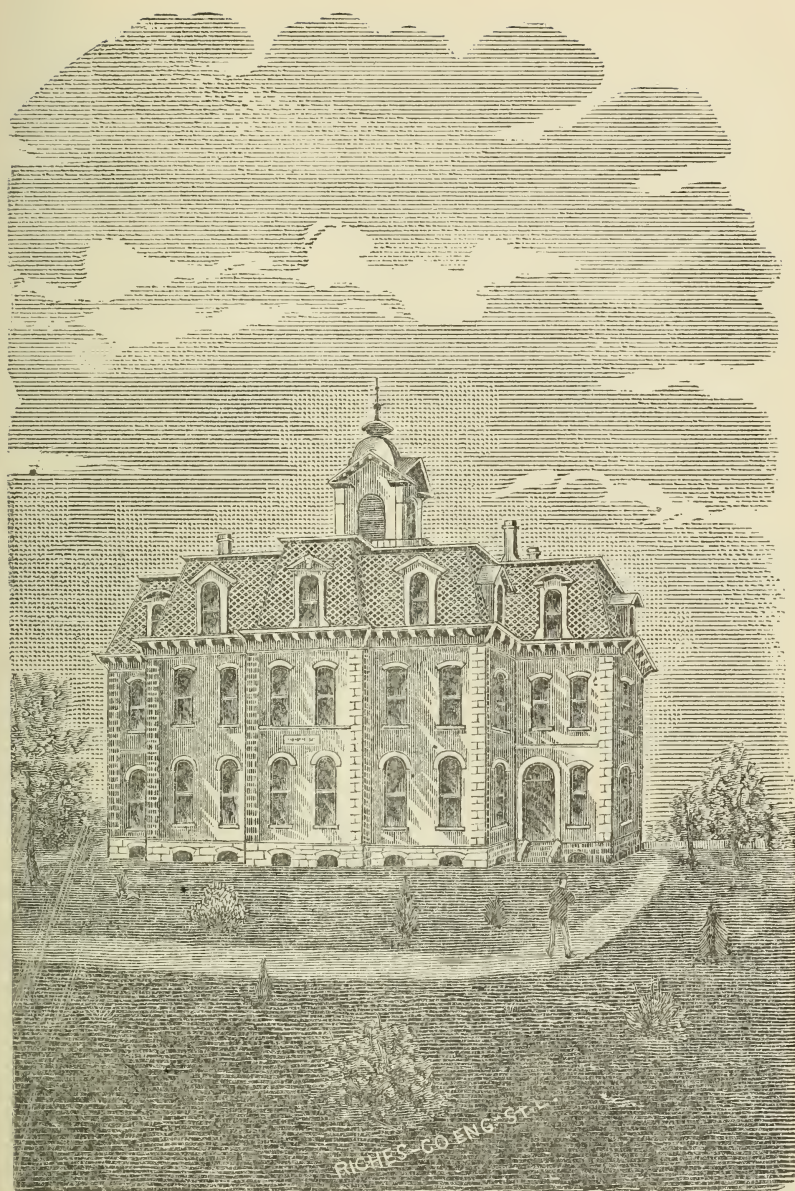
All works used as text-books in the school, as well as books of reference, can be purchased here on as favorable terms as in any of the eastern cities.

For any further information, in relation to the school, address

A. W. McALESTER, M. D.,
Dean of Medical Faculty, Columbia, Mo.

For catalogues, address

WOODSON MOSS, M. D.,
Secretary Medical Faculty, Columbia, Mo.



SCHOOL OF MINES AND METALLURGY—ROLLA.

CATALOGUE.

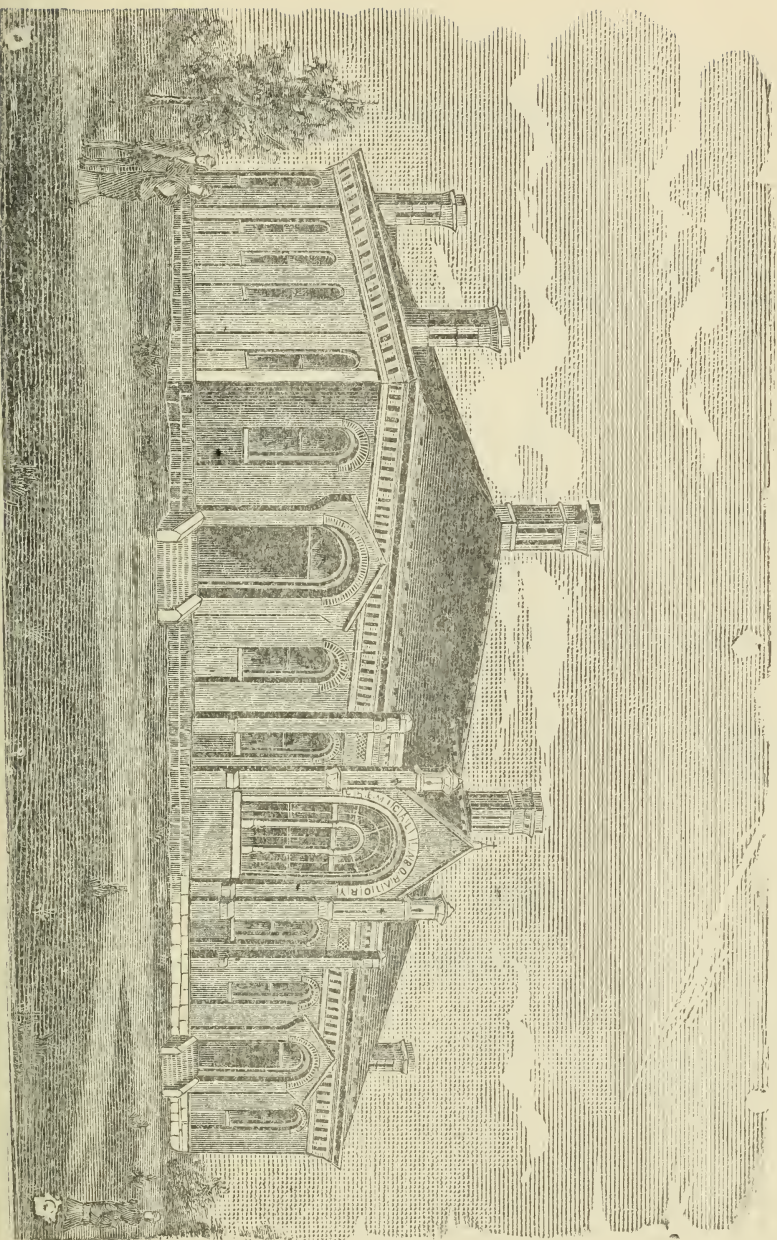
THE

SCHOOL OF MINES

OF THE

UNIVERSITY OF MISSOURI.

1890-1891.



LABORATORY—SCHOOL OF MINES.

CORPORATION.

“The University is hereby incorporated and created a body politic, and shall be known by the name of THE CURATORS OF THE UNIVERSITY OF THE STATE OF MISSOURI.”—Corporate name, Rev. Stat. 1879, Sec. 7230.

BOARD OF CURATORS.

HON. J. S. CLARKSON.....	Columbia....	} Term expires Jan. 1, 1893.
GEN. E. Y. MITCHELL.....	Rolla	
HON. R. B. OLIVER.....	Jackson	
HON. B. M. DILLEY.....	Hamilton....	} Term expires Jan. 1, 1895.
HON. B. R. CAUTHORN.....	Mexico	
HON. GARDINER LATHROP.....	Kansas City..	
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THE SCHOOL OF MINES.

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FACULTY.

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Professor of Engineering.

W. B. RICHARDS, M. A. (University of Virginia),
Professor of Mathematics.

CHASE PALMER, PH. D. (Johns Hopkins University),
Professor of Analytic Chemistry and Metallurgy.

E. A. DRAKE, M. A. (University of Wisconsin),
Instructor in Academic Department.

P. J. WILKINS, B. S. (Michigan A. and M. College),
Instructor in Preparatory Department.

GEO. R. DEAN, C. E. (Missouri School of Mines),
Instructor in Mathematics and Physics.

ARTHUR J. STEWART, B. SC. (Missouri School of Mines),
Instructor in Analytic Chemistry and Metallurgy.

INTRODUCTORY STATEMENT.

The School of Mines and Metallurgy is an Institute of Technology, a College of Engineering with Civil and Mining Engineering and Metallurgy as specialties. It is a College of the University of the State of Missouri, and is located at Rolla, Phelps county, on the line of the St. Louis and San Francisco railway, about one hundred miles southwest of St. Louis. The location, pre-eminently healthful, is in the midst of an extensive and rapidly developing iron section, with districts abounding in lead and zinc deposits within easy access, and thus affords excellent opportunities for the field study of the modes of occurrence of the ores of these metals, as well as for the practical investigation of their methods of treatment.

In 1889 a course in Mechanical Engineering was organized and added to the professional work of the institution. It is intended to develop this department fully, with the view of a mechanical laboratory and machine, shops in which thorough and practical instruction may supplement the class-work in the theory of Machinery and Mechanical Engineering.

In addition to the three courses of professional instruction, the college now offers three additional courses in special scientific work, each leading to the degree of Bachelor of Science.

It is the design of the school to give, in its special lines of work, instruction that is as complete and as exhaustive as may be attained, at once practical and thorough, based on scientific principles. Its diplomas are granted only to those who win them by honest, earnest and successful work. Throughout the course, thoroughness and a high standard of excellence is constantly held in view, and no effort is neglected which may tend to secure to the student a training which may enable him to become a successful engineer, or to reach a place among the educated scientists of the present day.

In order to maintain the high standard of the institution, it was found necessary to establish a preparatory department in which young men inadequately prepared could be trained to meet the requirements of the advanced work. This course is still maintained for the benefit of those who may wish to prepare themselves here for the work in the higher courses.

At the session of 1887 of the Legislature of Missouri, a bill was passed providing for the establishment of an academic course of study at the School of Mines. In pursuance of the provisions of this act the Academic department was therefore organized, and a general course in Academic instruction is offered as outlined in the exhibit of the Academic course.

Following the example of the Massachusetts Institute of Technology and the opinion of the American Society of Civil Engineers, it has been decided by the Faculty of the School of Mines to no longer confer the degree of Civil, Mining or Mechanical Engineer immediately on graduation, but to confer on graduation the degree of Bachelor of Science in Civil Engineering, Mining Engineering or Mechanical Engineering; and after a stated interval of time, during which the graduate has thoroughly identified himself with the profession, he may receive upon application to the Faculty the full degree in Civil, Mining or Mechanical Engineering.

SCHOOL OF MINES AND METALLURGY.

“Work is Victory,” stands as the motto of this department of the State University, and the new life infused into it within two years gives promise of a brilliant future. It is not to be denied that this school has failed in the past to come up to the full measure of the expectation of those who secured its establishment. This was chargeable partly to the lack of systematic work on the part of the Faculty, partly to the failure of the management of the University to give it hearty support, and largely to the General Assembly. Great results were expected of an institution which was not supplied with proper facilities for carrying out the work demanded. The first step in the direction of properly equipping the school was made in 1885, when an appropriation was made for building and equipping a chemical laboratory. This enabled the school to take front rank in chemical work of all kinds, and the good results that followed warrant the assumption that with complete equipment the school would soon take its proper position among the great scientific institutions of the country.

The school has been reorganized during the biennial period on a practical basis, and we now regard it as a school of the highest utility and intellectual attainments, and recommend that it be provided with proper equipment. Appropriations should be made for a metallurgical laboratory and also for a building for the engineering department. The necessity of these will be fully set out in the reports of the school.

The Thirty-fifth General Assembly appropriated \$5,000 to build a club-house for this school. The money was expended under the direction of Architect H. Hohenschild of Rolla, and the building is a credit not only to the school and architect, but to the State as well. Unless we except the chemical laboratory at this institution, we are satisfied that no money ever appropriated by the State for building purposes has been more judiciously expended.

The Board has expended about \$5,000 from the funds of the institution in repairing and repainting the school building, grading and fencing the park, putting in new walks, digging wells, etc., and now has the entire property in excellent condition. The money has been wisely invested.

To the criticism sometimes made on this school for not having a greater number of graduates each year, your committee deem it but just to say that, in our opinion, this is largely due to three facts: 1st, that the facilities have not been provided for a complete education in all the branches of scientific knowledge expected to be taught here, without more time, labor and expense than the average student of limited means can afford; 2d, that work and proficiency alone are the touchstones to the success rewarded by diplomas from this school; 3rd, that the demand for students who have not more than half finished the prescribed course required by this school before graduation, but who have become equipped for the work of surveyors and civil engineers to the extent that they command much greater wages than they could have done on entering the school, tempts many to make engagements that lead them away from the school before finishing the course, most of these students being of limited means.

COURSE OF INSTRUCTION.

The School of Mines and Metallurgy of the University of Missouri, in order to meet most fully the designs of its establishment as expressed in the act of the Legislature founding it—namely, “to teach such branches as are related to the mechanic arts and mining, without excluding other scientific and classical studies, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life”—and in the supplemental act of the Legislature of 1887 instituting an academic course, offers the following regular courses of instruction :

- | | |
|------------------------------|--------------------------------|
| I. Mining Engineering. | V. Mathematics and Physics. |
| II. Civil Engineering. | VI. General Scientific Course. |
| III. Mechanical Engineering. | VII. Academic Course. |
| IV. Chemistry. | VIII. Preparatory Course. |

Courses I and II are the Professional Courses about as now established. Course III is a Professional Course introduced with the coming session. Courses IV and V present an opportunity to pursue fully special lines of scientific work. Course VI is, as its name indicates, a general scientific course, including a greater variety of subjects than either of the preceding, but with relatively smaller requirements in each. Course VII is the Academic Course as at present maintained.

For the satisfactory completion of any of Courses I–VI, inclusive, the degree of Bachelor of Science in the course pursued is conferred. In the Professional courses I, II and III, as stated elsewhere, the degree of Mining, Civil or Mechanical Engineer is, in accordance with the best usage of the day, conferred only upon certain conditions subsequent to graduation. For the completion of Course VII a certificate of proficiency in the Academic Course is bestowed, but no titled degree is given.

To pursue successfully the studies of any of the Baccalaureate Courses, I–V, a thorough knowledge of Elementary Algebra and Geometry is essential, and for most of them a similar acquaintance with the elements of Physics and Chemistry is highly desirable, if not equally necessary. The Preparatory Course (VIII) is maintained for the benefit of those who lack such preparation. Students who finish this course receive a certificate stating the fact of such completion. Experience has shown that frequently valuable time is wasted by men in attempting the higher work without having adequately grasped preliminary subjects, and, hence, to guard against the disappointment that must almost inevitably follow such misdirected efforts, it will in the future be required as a condition of entrance upon the work of any of the courses, I–V, inclusive, that applicants must either have done the work of the Preparatory Course here, or have stood an examination upon its equivalent in Mathematics at least.

The work of the College is distributed among the five schools of Mining, Civil and Mechanical Engineering, Analytical Chemistry and Metallurgy, Pure Mathematics, Mineralogy and Geology, and Physics, and an Academic and a Preparatory department. At present, instruction in Mineralogy and Geology is given by the Professor of Chemistry. The elementary work of Physics is chiefly carried on in the Preparatory department, while the course in Analytic Mechanics is now assigned to the School of Engineering.

Below will be found a scheme of the studies in each course. By comparing this schedule with the subsequent statements of the work in the individual schools, the character and amount of the requirements in each case may be learned. Appli-

cants for degrees are invariably required to complete here the full amount of work as prescribed, in order to obtain the degree. While the work of each course is distributed among three distinct classes, each extending through one year, the degree is conferred, not for attendance during any definite or indefinite period of time, but for actual work done. Thus, in exceptional cases, a man who is well prepared and capable might by diligence attain the degree in two years.

Outside of the regular degree courses, students may take special courses in Engineering, Assaying, Chemistry, or Mathematics,

SCHEDULE OF STUDIES.

I—COURSE OF STUDY IN MINING ENGINEERING.

JUNIOR CLASS.

Trigonometry,	Blowpipe Analysis,	Engineering Instruments,
Analytic Geometry,	Determinative Mineralogy,	Drawing,
General Chemistry,	Qualitative Analysis,	Field work.
	Descriptive Geometry,	

INTERMEDIATE CLASS.

Solid Analytic Geometry,	Mineralogy and Geology,	Drawing,
Differential Calculus,	Qual. and Quan. Analysis,	Assaying.
Integral Calculus,	Geodesy,	Field Work.
Chemical Technology,	Exploitation of Mines,	

SENIOR CLASS.

Metallurgy,	Applied Mechanics,	Assaying,
Qualitative Analysis,	Quantitative Analysis.	Thesis.

II—COURSE OF STUDY IN CIVIL ENGINEERING.

JUNIOR CLASS.

Trigonometry,	Blowpipe Analysis,	Engineering Instruments,
Analytic Geometry,	Determinative Mineralogy,	Drawing,
General Chemistry,	Descriptive Geometry,	Field Work.

INTERMEDIATE CLASS.

Solid Analytic Geometry,	Mineralogy and Geology,	Lines of Communication,
Differential Calculus,	Geodesy,	Drawing,
Integral Calculus,	Engineering Constructions,	Field Work.

SENIOR CLASS.

Analytical Statics,	Drawing,	Field Work,
Applied Mechanics,	Stability of Structures.	Thesis.
Materials of Construction,	Hydraulic Engineering,	

III—COURSE OF STUDY IN MECHANICAL ENGINEERING.

JUNIOR CLASS.

Trigonometry.	Blowpipe Analysis,	Engineering Instruments,
Analytic Geometry,	Determinative Mineralogy,	Drawing,
General Chemistry,	Descriptive Geometry,	Field Work.

INTERMEDIATE CLASS.

Solid Analytic Geometry.	Integral Calculus,	Physics,
Differential Calculus,	Mineralogy and Geology,	Statics,
	Kinematics of Machinery.	

SENIOR CLASS.

Strength of Materials,
Theory of Prime Movers.

Dynamics,
Mechanics of Machines,

Thesis.

IV—COURSE OF STUDY IN CHEMISTRY.

JUNIOR CLASS.

General Chemistry,
Blowpipe Analysis,

Determinative Mineralogy,
Qualitative Analysis,

German.

INTERMEDIATE CLASS.

Qualitative Analysis,
Quantitative Analysis,

Assaying,
Chemical Technology,

Mineralogy and Geology,
German.

SENIOR CLASS.

Metallurgy,
Qualitative Analysis,

Quantitative Analysis,
Assaying,

Thesis.

V—COURSE OF STUDY IN MATHEMATICS AND PHYSICS.

JUNIOR CLASS.

Trigonometry,
Analytic Geometry,

Descriptive Geometry,
Physics,

French or German.

INTERMEDIATE CLASS.

Solid Analytic Geometry,
Differential Calculus,

Integral Calculus,
Statics,
French or German.

Kinetics,
Dynamics,

SENIOR CLASS.

Projective Geometry.
Theory of Equations,
Differential Equations,

Determinants,
Quaternions,
Statics,

Dynamics,
Sound, Light, Heat, or Elect'y.
Thesis.

VI—COURSE OF STUDY IN GENERAL SCIENCE.

JUNIOR CLASS.

Higher Algebra,
Geometry,

History,
French or German,

Composition and Rhetoric.

INTERMEDIATE CLASS.

Trigonometry,
Analytic Geometry,

Physical Geography,
Geology,

Physics,
French or German.

SENIOR CLASS.

General Chemistry,
Botany and Zoology,

Astronomy,
Political Economy,

English Literature.
Thesis.

VII—ACADEMIC COURSE.

FIRST YEAR.

First Term:

Mathematics,	-	-	-	-	-	-	-	Arithmetic and Algebra.
Language,	-	-	-	-	-	-	-	English Grammar.
History,	-	-	-	-	-	-	-	U. S. History.

Second Term:

Mathematics,	-	-	-	-	-	-	-	Arithmetic and Algebra.
Language,	-	-	-	-	-	-	-	Composition and Rhetoric.
Science,	-	-	-	-	-	-	-	Physical Geography and Physiology.

SECOND YEAR.

First Term:

Mathematics,	-	-	-	-	-	-	-	-	Geometry
Language,	-	-	-	-	-	-	-	-	French or German.
Science.	-	-	-	-	-	-	-	-	Physics.

Second Term:

Mathematics,	-	-	-	-	-	-	-	-	Geometry.
Language,	-	-	-	-	-	-	-	-	French or German.
History,	-	-	-	-	-	-	-	-	General History,
Science,	-	-	-	-	-	-	-	-	Civil Government.

THIRD YEAR.

First Term:

Language,	-	-	-	-	-	-	-	-	French or German.
Literature,	-	-	-	-	-	-	-	-	English Literature.
History,	-	-	-	-	-	-	-	-	English History.

Second Term:

Language,	-	-	-	-	-	-	-	-	French or German.
Science,	-	-	-	-	-	-	-	-	<div style="display: inline-block; vertical-align: middle;"> <div style="font-size: 2em; vertical-align: middle;">{</div> Chemistry, Botany, Political Economy, Book-keeping (optional). </div>

VIII—PREPARATORY COURSE.

FIRST YEAR.

First Term:

Mathematics,	-	-	-	-	-	-	-	-	Higher Arithmetic and Algebra.
Language,	-	-	-	-	-	-	-	-	English Grammar.
History,	-	-	-	-	-	-	-	-	U. S. History.

Second Term:

Mathematics,	-	-	-	-	-	-	-	-	Algebra.
Language,	-	-	-	-	-	-	-	-	Composition and Rhetoric.
Science,	-	-	-	-	-	-	-	-	Physical Geography.

SECOND YEAR.

First Term:

Mathematics,	-	-	-	-	-	-	-	-	Higher Algebra and Geometry (Plane).
Science,	-	-	-	-	-	-	-	-	Physics.

Second Term:

Mathematics,	-	-	-	-	-	-	-	-	Higher Algebra and Geometry (Space).
Science,	-	-	-	-	-	-	-	-	Chemistry and Physics.

SCHOOL OF ENGINEERING.

Prof. W. H. ECHOLS.

The School is organized with a view to acquaint the student *familiarly and practically* with the principles of his profession. The instruction is as thorough as possible, and is given partly through text-books and partly through lectures, with daily examinations upon both. A high standard of excellence in attainments is rigidly adhered to and required for the satisfactory completion of the course.

The work of this School is distributed among three departments of engineering, namely, the Civil, Mining and Mechanical branches of the profession, as follows :

CIVIL ENGINEERING.

The work of this department is distributed among the three classes :

JUNIOR.

1. *Descriptive Geometry*.—Theory of Parallel Projections, Orthogonal, Axonometric and Oblique, with the Construction of Shades and Shadows. Theory of Central Projections, or Linear Perspective.

2. *The Instruments*.—The instruments of the engineer, both field and office, are considered in order—their principles, details, construction, adjustments and uses.

3. *Drawing*.—The easy and accurate use of pen and brush is first acquired by exercises, and developed by application to projective drawings, shading and shadows ; lettering.

4. *Field Work*.—The members of the Junior Class enter the corps with the grade of Rodmen, and are required to do duty in that capacity before being advanced.

INTERMEDIATE.

1. *Engineering Geodesy*.—Theory and descriptions of engineering field instruments, their uses, capabilities, measures of approximation and of precision are thoroughly discussed and applied in the measurement of horizontal and vertical distances and angles : general and particular methods and problems in traversing ; triangulation, direct and indirect leveling ; land, city, orographic and hydrographic surveying ; government and engineering geodetic work ; tachymetric processes.

2. *Engineering Construction*.—Surface excavation and mensuration of same ; construction of shafts and tunnels ; foundations on land and under water ; materials of construction—timber, stone, brick, mortars and cements, and iron ; building construction.

3. *Lines of Communication*.—Preliminary survey, location and construction of railways, highways, streets, canals, tunnels and bridges.

The greater portion of half the session being devoted to the study of Railroad Engineering, every effort is made to insure this part of the course being of the highest practical value to the student possible.

4. *Drawing*.—The applications of projective geometry to stone cutting ; the projections, templates and directing instruments for same ; and to spherical projections ; working draughts of engineering structures, such as piers, foundations, wing walls, abutments, coffer-dams, caissons, trestles, mine timbering, etc., in all their details ; construction of maps.

5. *Field Work*.—The members of the Intermediate Class rank in the corps as instrument men, and in the field acquire practical knowledge of the use of all the field instruments of the engineer, including the compass, barometer, level, transit, solar, stadia and plane table.

SENIOR.

1. *Engineering Mechanics*.—General theory of force, stress, strain, energy, and hydraulics, with applications to the analysis of structures ; to the design of the elements of structures and machines ; pipes for water, air and steam ; ditches, flumes and canals for water, etc.

2. *Stability of Structures*.—Amount and distribution of load on structures ; stability of elementary structures, the girder, the cable, the arch, the pier, with applications to the design of bridges, roofs, buildings, dams, abutments, arches, revetments, etc.

3. *Hydraulic Engineering*.—Collection and filtration of potable water; conveyance of water, either by gravity or pumping; drainage, sewerage and water supply of cities and towns; disposal of sewage.

4. *Drawing*.—The application of graphical analysis to the solution of statical problems of design, the stresses in structures; lines of resistances in dams, arches and piers; finished drawings, with colors and shadows in connection with the structures designed, their details in full; topographical maps.

5. *Field Work*.—The members of the Senior class enter the field as chiefs of parties, and it is under their direction and charge (subject to the professor's instruction, that the corps carries on the prescribed field work and surveys.

MINING ENGINEERING.

The work of this department is carried on in three classes, as follows:

JUNIOR.

1. *Descriptive Geometry*.—Theory of Parallel Projections, Orthogonal, Axonometric and Oblique, with the construction of Shades and Shadows. Theory of Central Projections, or Linear Perspective.

2. *The Instruments*.—The instruments of the engineer, both field and office, are considered in order—their principles, details, construction, adjustments and uses.

3. *Drawing*.—The easy and accurate use of pen and brush is first acquired by exercises, and developed by application to projective drawings, shading and shadows; lettering.

4. *Field Work*.—The members of the Junior class enter the corps with the grade of Rodmen, and are required to do duty in that capacity before being advanced.

INTERMEDIATE.

1. *Engineering Geodesy*.—Theory and descriptions of the engineering field instruments, their uses, capabilities, measures of approximation and of precision are thoroughly discussed and applied in the measurement of horizontal and vertical distances and angles; general and particular methods and problems in traversing; triangulation, direct and indirect leveling; land, city, orographic and hydrographic surveying; government and engineering geodetic work; tachymetric processes.

2. *Engineering Construction*.—Surface excavation and mensuration of same; construction of shafts and tunnels; foundations on land and under water; materials of construction—timber, stone, brick, mortars and cements, and iron; building construction.

3. *Exploitation of Mines*.—Ore deposits in beds, lodes, placers and pockets; location and attack by shaft, incline and adit; underground transport in galleries, inclines and shafts; drainage by adits or pumps; ventilation by furnace or blowers; lighting; and mechanical concentration of ores.

4. *Drawing*.—The applications of projective geometry to stone-cutting; the projections, templets and directing instruments for same; and to spherical projections; the representations of underground workings of mines in plan, elevation and axonometric projections; working draughts of engineering structures, the simpler machines used in mining and ore-dressing and concentration, hoists, cages, tramways; the draughting of maps, flat and topographical, geological sections and sketch views of the terrain.

5. *Field Work*.—The members of the Intermediate class rank in the corps as instrument men, and in the field acquire practical knowledge of the use of all the

field instruments of the engineer, including the compass, barometer, level, transit, solar, stadia and plane table. Particular attention is given to the field work of the United States Deputy Mineral Surveyor and the use of the solar instrument.

SENIOR.

1. The work of this class consists of a prescribed course in Statics, Dynamics and Mechanics, with applications to the simple engineering structures and the principles of design and strength of materials.

MECHANICAL ENGINEERING.

The work of this department is also carried on in three classes.

JUNIOR.

1. *Descriptive Geometry*.—Theory of Parallel Projections, Orthogonal, Axonometric and Oblique, with the Construction of Shades and Shadows. Theory of Central Projections, or Linear Perspective.

2. *The Instruments*.—The instruments of the engineer, both field and office, are considered in order—their principles, details, construction, adjustments and uses.

3. *Drawing*.—The easy and accurate use of pen and brush is first acquired by exercises, and developed by application to projective drawings, shading and shadows; lettering.

4. *Field Work*.—A knowledge of the simple field operations is required of these students, as well as proficiency in the use of the engineer's transit and level.

INTERMEDIATE.

1. *Class Work*.—The previous course in Physics is here supplemented by a full course in Physics, Statics, Dynamics and Kinematics, strictly with reference to the needs of the Mechanical Engineer.

2. *Drawing*.—The drawing board is in constant use throughout the year, the student making use of his previous training in constructing drawings of machinery, in shading, casting shadows and coloring the same, and making graphical constructions of physical problems.

SENIOR.

1. *Engineering Mechanics*.—General theory of force, stress, strain, energy, and hydraulics, with applications to the analysis of structures; to the design of the elements of structures and machines; to thermodynamics and the theory of heat engines; to the design of fly-wheels, governors, etc.; pipes for water, air and steam; ditches, flumes and canals for water, etc.

2. *Mechanics of Machines*.—Theory of gearing, simple and compound; constructive mechanism, including the design of machines; efficiency of mechanism; regulators, including brakes; accumulators, governors and valves; transmission of energy and power, teledynamic, pneumatic and electric.

3. *Theory of Prime Movers*.—Hydraulic engines, water wheels, turbines and pumps; steam engines, including the design of the furnace, the boiler, the condenser and the engine proper; pneumatic engines and blowers; electric engines and dynamos.

4. *Drawing*.—The application of Graphical Analysis to the solution of Statical problems of design and mechanism; the finished drawings of designed machinery, details of construction, etc., etc.

A course of parallel reading of monographs by the best authors (with which the library is abundantly supplied) is prescribed in connection with the lectures and

the subject matter included in the examination papers. The best engineering periodicals of America, England and France are taken by the department, and are always at the disposal of the student, who is constantly referred to them and urged to read them. A feature of the work in the Engineering School is weekly meeting of the Quiz Club, in which the current articles in the engineering journals are discussed, and other topics relating to the professional work made familiar through discussion by the members. In the field work the student is thoroughly drilled in the best methods of survey and location known in modern practice. Expert and rapid manipulation of all the field instruments of the engineer is insisted upon; accuracy combined with rapidity is the essential feature. In the drawing-room the student is steadily employed throughout the course in every variety of pen work of which the engineer makes use. In projective geometry the course is extensive and thorough, and insidious use of the drawing board is necessary for success.

Especial attention is given to the Graphical Statics, and to the solution of engineering problems by aid of the graphical processes. In design, specifications are furnished the students and written theses required, showing the design accompanied by all the necessary computations (arithmetical and graphical), finished drawings of the structures and details of the pieces, with working draughts for workmen. Particular stress is laid upon railway engineering as practiced in this country in all its details of preliminary survey, location and construction. In all the work of the department the student is encouraged to think for himself, to acquire confidence in what he knows to be correct, and to depend upon his own resources, to grasp subjects and not text-books.

In the absence of a professor for the chair of Physics, instruction in Analytical Mechanics is given in the department. Todhunter's Analytical Statics, New Edition, and Williamson's Dynamics are gone through in the beginning of the Senior year, thus preparing the student to take firm hold of the Applied Mechanics of the Engineering School.

While the degree courses as laid down will be strictly adhered to for all who apply for the degrees, special students may pursue any particular course which they may elect and receive certificates therefor. Men who have neither the time nor the means to enable them to take the full engineering course will find it advantageous to concentrate a year's work upon some special branch of the profession.

TEXT BOOKS—Church's and Waldo's Descriptive Geometry, with La Gournerie, Weiner and Breithoff for reference. Rankine's Works, Cotterill's Applied Mechanics, Lanza's Applied Mechanics, DuBois' Graphical Statics, Chalmer's Graphical Determination of Forces in Engineering Structures, Callon's Lectures on Mining, Andre's Coal Mining, Kennedy's Mechanics of Machinery, Perry's Steam, Herrmann's Graphical Statics of Mechanism, Trautwine's or Molesworth's Pocket-book, Searle's or Henck's Field-book.

SCHOOL OF PHYSICS.

In the absence of a professor for this very important school the advanced work of the department is carried on by the Professor of Engineering, while the lower work is done by Mr. Wilkins.

In the Preparatory Department one year's work is given to Elementary Physics. The class meets five times each week throughout the session.

The object of the work here is to furnish the student with an introduction to Modern Physics, and to acquaint him with its methods of investigation. With the

design of laying a thoroughly scientific basis for the course, a large space is given at the outset to the discussion of the cardinal doctrines of motion, force, energy, and potential, and to their simpler applications in the pressure and motion of visible masses.

With this preparation the student proceeds to the subject of Molecular Physics, embracing Sound, Light, Heat and Electricity. Throughout the course the laws of motion and force are kept steadily in view, and an attempt is made to exhibit the evidence, daily becoming stronger and clearer, for the belief prevalent among scientists that the entire body of Physics is a coherent and harmonious system of mechanical truth.

In the school proper there are three classes in Physics, extending through three years of progressive work.

JUNIOR CLASS.

The work of this class covers the same ground as that of the preparatory class. The treatment is wider and deeper. The popularization of the subject is now laid aside for the spirit of investigation, and Elementary Physics is gone into more extensively and a larger knowledge of pure mathematics required of the student. Those having a working knowledge of Trigonometry and Analytical Geometry take this class without having previously had the lower one. It is, however, advisable to take the two together.

INTERMEDIATE CLASS.

This class begins with the study of Mechanics, and reads some such text-book as Bowser's during the first half year. This is all that is required of engineering students. Special students in Physics then read Statics (Todhunter or Minchin), Kinematics (Minchin), Dynamics (Williamson, Prie, Routh).

SENIOR CLASS.

The work of the preceding class may be extended into this year, or the student may devote himself to the mathematical treatment of one or more of the following subjects: Sound, Light, Heat, Electricity, Elasticity or Motion of Fluids.

It is to be hoped that the next Legislature may appropriate necessary funds for the purpose of erecting a physical laboratory, a feature much needed in the institution.

SCHOOL OF ANALYTICAL CHEMISTRY AND METALLURGY.

Prof. CHAS. PALMER, Mr. A. J. STEWART.

The courses in this school have been especially arranged to supply the needs of those who wish to prepare themselves for positions as Assayers, Chemists and Mining Engineers. Students who are desirous and capable of accomplishing special lines of work, may arrange for such courses in Analytic Chemistry and Assaying as are adapted to their special requirements.

Instruction in the following courses is regularly given each session:

- | | | |
|--------------------------|---|------------------------|
| I. General Chemistry, | IV. Blowpipe Analysis and | V. Analytic Chemistry. |
| II. Chemical Technology, | Determinative Mineralogy, VI. Assaying. | |
| III. Metallurgy. | | |

1. *General Chemistry*.—The instruction in this course is communicated to the members of the Junior Class by means of lectures and recitations based upon Watt's edition of Fowne's Chemistry. The course includes the subjects of Chem-

ical Physics, Chemical Philosophy and Inorganic Chemistry, and, in addition thereto, regular weekly exercises in Stoichiometry and other problems of a chemical nature. The class meets three times a week throughout the session.

2. *Chemical Technology*.—The Intermediate Class meets three times a week throughout the session. Instruction is communicated by lectures and recitation based upon Wagner's Chemical Technology. The general principles involved in the smelting and treatment of the ores of the metals are first considered; followed by a description and explanation of the processes employed in the manufacture of Acids, Salts, Glass, Paper, Mortar, Cements and other Building Materials, Sugar, Wine, Spirits, Oils, Paints, Soaps, Bleaching Materials, Fuels, etc., etc.

The school is at present but poorly supplied with the models, drawings and specimens necessary for thorough instruction in the above subjects, but it is hoped that the additions which are constantly being made to its equipment will eventually make it approach to what it should be.

3. *Metallurgy*.—In addition to the brief course required of the Intermediate class, the members of the Senior class meet weekly for the discussion of assigned topics in the Metallurgy of Gold, Silver, Copper, Zinc, Lead and Iron. Special topics are assigned to each student, upon which he is required to prepare a paper embodying the results of his reading in the authoritative works on Metallurgy, with which the Library is well supplied; these papers are taken up in class and critically discussed by the other students.

WORKS OF REFERENCE.—Crooke's and Rohrig's, Percy's, Eggleston's and Phillips' works on Metallurgy; Bell's Iron Smelting and the Transactions of the American Institute of Mining Engineers.

4. *Blowpipe Analysis and Determinative Mineralogy*.—This class meets regularly three times each week throughout the session for instruction and practice. Previous to beginning regular practice with the blowpipe, each student is required to complete a series of experiments designed for preliminary training in chemical manipulations and to illustrate the properties of the more important chemical elements and the nature of chemical reactions; after which salts, oxides and alloys are given to each student, on whose composition as determined by blowpipe tests alone he is required to report. This work is followed by a course of exercises in Determinative Mineralogy.

TEXT-BOOK.—Erni's Blowpipe Analysis and Determinative Mineralogy.

5. *Analytic Chemistry*.—This course is begun with a series of selected exercises in Qualitative Analysis. These exercises, at first simple, are made more and more complex as the skill of the student increases. After a student attains sufficient skill to enable him to determine with a fair degree of accuracy the composition of substances given him, he is allowed to begin Quantitative Chemical Analysis. In connection with this work, the student is required to complete one exercise each week in Qualitative Analysis as long as he remains in the Laboratory.

In order to complete the full course in Quantitative Chemical Analysis, each student must complete satisfactory analyses of the following substances:

- | | | |
|----------------------------------|-------------------|--|
| 1. Zinc Sulphate. | 14. Stibnite. | 23. Pyrolusite. |
| 2. Barium Chloride. | 15. Arsenopyrite. | 29. Bleaching Powder, valuation. |
| 3. Potassium Aluminium Sulphate. | 16. Cerussite. | 30. Soda Ash, valuation. |
| 4. Copper Sulphate. | 17. Calamine. | 31. Coal, proximate, ultimate and heating power. |
| 5. Di-Sodic Phosphate. | 18. Orthoclase. | 32. Borax. |
| 6. Strontium Nitrate. | 19. Kaolin. | 33. Beryl. |
| 7. Ammonia—Ferric Sulphate. | 20. Chromite. | 34. Potable Water. |
| 8. Fluor-spar. | 21. Hematite. | 35. Mineral Water. |
| 9. Manganese Carbonate. | 22. Cast Iron. | 36. Guano. |
| | 23. Spelter. | |

- | | | |
|-------------------------------|-------------------------|-----------------------------|
| 10. Nickel Ammonium Sulphate. | 24. Lead. | 37. Super-phosphate. |
| 11. Limestone. | 25. Regulus. | 38. Sugar. |
| 12. Galenite. | 26. Blast Furnace Slag. | 39. Potassium Ferrocyanide. |
| 13. Chalcopyrite. | 27. Lead Furnace Slag. | |

Applicants for the degree of Mining Engineer omit all after No. 28.

TEXT-BOOKS—Fresenius' Qualitative and Quantitative Analysis.

6. ASSAYING.—The course in assaying begins with the second term of the second class, usually about February 1. This work is usually completed in five months.

Special attention in this course is given to the rapid estimation and valuation of ores and furnace products, both by the fire and wet assay.

Fire Assays.—Gold and silver ores, also mill checks, are made the subjects of special study, and assays both by the crucible and scarification methods are required. Lead and copper ores are assayed by fire methods applicable to the ores in question.

Wet Assays.—Volumetric methods are carefully studied and applied to the rapid determination of copper, zinc, iron, etc., etc.

TEXT-BOOK—Rickett's Assaying.

Special students may pursue at their discretion the study and analysis of any class of ores or metallurgic products. Young men who have neither the time nor means to spare to take the full course may accomplish much in the way of chemical analysis and assaying by devoting their entire time to it during a single year.

All laboratory students furnish their own blowpipes, platinum, crucibles and apparatus, silver and gold solutions, and pay for gas and fuel consumed and for apparatus damaged or broken.

A deposit of \$5 per term, covering the value of the apparatus and chemicals issued, is required to be placed in the hands of the Treasurer by each laboratory student. This deposit, less the value of material consumed, is returned at the close of the year.

THE NEW CHEMICAL LABORATORY.

The new Chemical Laboratory has been in use four years, and has been found satisfactory in every respect. It was planned and built solely with reference to the work in the school, and the entire building is used by the Chemical Department.

In this building there are the following departments: The quantitative laboratory; the qualitative laboratory; director's laboratory; lecture room; assay laboratory and weighing room; a quantitative and qualitative evaporating room; preparation room; a supply room, and two basement rooms, furnishing accommodations for seventy-five students.

In the construction of this laboratory, no pains were spared to make the assay laboratory complete in every respect. It is located on the first floor and not in the basement. The reduction furnace as well as the muffle furnaces are of the newest and best. The large muffle furnace holds four muffles. An ore-crusher, pulverizing-plate, with other facilities, are provided for the use of students.

Facilities for securing heat, light and ventilation are very perfect; ample provision is also made for carrying off foul and dangerous gases. All parts of the building are thoroughly and judiciously equipped; nothing has been left undone to make this laboratory one of the most complete in the country. Gas and water are supplied to each table.

The laboratory contains, in addition to a large assortment of the apparatus regularly and ordinarily met with in well-equipped institutions, one of Becker's Lithological Microscopes, Contact and Reflecting Goniometers, Dynamo for experimental work in Electrolysis, and other valuable pieces of apparatus for work and research.

The Chemical Laboratory is open to students for work, daily, from 8 a. m. to 5 p. m.

SCHOOL OF MINERALOGY AND GEOLOGY.

The instruction on these subjects is communicated to the members of the Intermediate classes.

Models, diagrams and natural crystals are used in imparting a knowledge of the principles of Crystallography. Systematic Mineralogy is taught in conjunction with exercises in Determinative Mineralogy.

In addition to the usual course in Physical Geography, Dynamical, Structural and Historical Geology, special attention is given to Chemical and Economic Geology. The course of instruction embraces the origin of vein stones and ore deposits, mineral waters, coal, petroleum and natural gas.

SCHOOL OF MATHEMATICS.

Prof. RICHARDS, Mr. DEAN.

Great importance is attached to the study of Mathematics wherever it forms a part of the curricula. The School offers beyond the Preparatory Course, which completes Algebra and Geometry, three years' work, different amounts of which, as will be seen by the subsequent statements, are required in different courses. In order to enter the Junior class, which begins with trigonometry, the student must either have completed the Preparatory course here, or must stand a satisfactory examination upon as much Mathematics as is contained in it.

In the Engineering Courses the ultimate intention of the student is prominently kept in mind, and such points as have an especial bearing upon his technical work are emphasized as occasion may suggest. The tendency, however, too frequently observable in technical schools, to cramp the Mathematical instruction within the limits of a meagre preparation for professional work, is avoided, and the treatment of each subject is, in general, designed to be as broad and full as may be in the allotted time.

At the same time that the facts are taught, the utility of mathematical study as a mental discipline is duly recognized, and an effort is made to promote habits of exact, logical reasoning, and to stimulate originality and independence of thought.

The Junior Class meets five times a week; the Intermediate and the Senior each three times.

At each meeting, the class is examined on matter previously assigned, and, when expedient, explanations of the text and supplementary lectures and notes are given. The student is constantly exercised in work at the black-board, reproducing demonstrations and applying demonstrated principles to the solution of special examples.

JUNIOR CLASS.

The Junior Class studies Trigonometry, Plane and Spherical, throughout the first half of the year. The class is thoroughly drilled in the Fundamental Definitions and Formulæ. The construction and use of Logarithmic tables are taught, and numerous examples in the solution of triangles, involving the use of Logarithms, are given. Occasionally, actual heights and distances are required to be calculated by Trigonometric methods.

The second half of the year is taken up with the study of the Conic Sections and a few of the higher Plane Curves.

MISSOURI SCHOOL OF MINES.

Text-Books—Snowball's Trigonometry (Plane and Spherical), Wentworth's Analytic Geometry.

For Reference—Todhunter's Plane and Spherical Trigonometry, Puckle's Conic Sections, Todhunter's Conic Sections, Searle's or Henck's Field Book.

This class is uniformly required in Courses I, II, III, V and VI.

INTERMEDIATE CLASS.

The class begins with Analytic Geometry of three dimensions, studying only surfaces of the second degree—the conicoids. The Differential Calculus is then taken up, and the principles arrived at are applied in the development of functions, the solution of problems of maxima and minima, the investigation of the properties of curves, and the tracing of curves from their equations. In the Integral Calculus, the elementary formulæ of integration are developed and applied to numerous examples, and considerable attention is paid to the use of Definite Integration in the rectification of curves, the quadrature of surfaces and the cubature of volumes.

Text-Books—Venable's Notes on Solid Geometry, Williamson's Differential Calculus, Williamson's Integral Calculus.

For Reference—Todhunter's and Salmon's Mathematical works and the Mathematical articles in the Encyclopædia Britannica.

The above is required in Courses II, III and V. For students of Mining Engineering (Course I) a briefer treatment of the same subjects extending through one term is given. This will include such a short discussion of Analytic Geometry of three dimensions as is found in Wentworth's An. Geometry, and in calculus some such work as Taylor's "Elements of the Calculus," or notes by the professor.

SENIOR CLASS.

The work of this class is designed only for students who are taking the special course in Mathematics and Physics (V), and such others as may wish to extend their Mathematical studies beyond the usual under-graduate range. The course will be susceptible of a certain amount of variation from year to year, at the Professor's discretion, to meet the needs and accord with the purposes of the applicants. It will include selected portions of some of the following subjects: Projective Geometry, Theory of Equations, Determinants, Differential Equations, Quaternions.

TEXT BOOKS—Cremona's Projective Geometry, Todhunter's Theory of Equations, Muir's Theory of Determinants, Forsyth's Differential Equations, Kelland and Tait's Quaternions.

Lectures on the History of Mathematics are given during the year.

A collection of the chief works on Mathematics in English, French and German, which is contained in the Library, affords the student an opportunity of extending his research at will.

ACADEMIC COURSE.

Mr. DRAKE and Mr. WILKINS.

The following Academic Course of study was established in pursuance of an act of the Legislature of Missouri, 1887. It is designed to make the course equal in every respect to those offered at the best academies. As now arranged it will commend itself especially to young men who wish to fit themselves for successful business or professional life, and to teachers who wish to prepare for the higher work in their calling.

LANGUAGE, LITERATURE AND HISTORY.

GERMAN.—The course extends through two years, and consists of exercises in translation and conversation, and of a study of the gems of German literature. An effort is made, first of all, to give the student a thoroughly practical knowledge of the language. In addition to this, technical students may acquire such facility in translation as will enable them to read German scientific works in the original. The excellent mental discipline that may be derived from the study of a foreign language, and the great aid that such study may afford to the understanding of one's own language, is not overlooked.

FRENCH.—The main object is to give the student practical reading knowledge of the language. Otto's French Grammar, *Le Roman d'un Jeune Homme Pauvre*, and *La Petite Fadette* occupy the first year of the course. The second year is devoted to scientific and dramatic French, and to lectures on the history and literature of the language.

ENGLISH GRAMMAR.—A familiarity with forms and with principles of construction is insisted upon. Written exercises are required daily, from the belief that painstaking practice under proper supervision is the best, if not the only means of acquiring facility in the use of good English.

TEXT-BOOK—Harvey's Grammar.

COMPOSITION AND RHETORIC.—It will be seen that this subject follows immediately, as it naturally should, upon that of Grammar. The student is required to practice letter-writing at the very beginning of the work. From this style of composition to others, the steps are taken with ease. Instruction is given with a view to practical results: it is designed not only to impart a knowledge of principles, but also to develop a facility in the application of them.

TEXT-BOOK—Hill's Elements of Rhetoric and Composition.

ENGLISH LITERATURE.—An attempt is made to lead the student to form a correct estimate of the literary value of English productions, and also to direct his attention to the peculiar social and political conditions of which the literature of any particular period is an expression. In this regard, this course and that in English history are made to supplement each other. Time is given to a study of the masterpieces from Chaucer's time to the present, and to a perusal of standard authorities on the literature of the language. The library is well supplied with works of reference.

TEXT-BOOK—Shaw's History of English and American Literature.

ENGLISH HISTORY.—It will be seen that this subject and that of English Literature are pursued during the same term. The two are so intimately associated that the importance of this arrangement can hardly be over-estimated. An effort is made to present the subject of English History in a manner that shall illustrate the great

law of national growth, in the light thrown upon it by the foremost English historians. The library contains the works of many of the leading authorities on this subject.

TEXT-BOOK—Montgomery's "The Leading Facts of English History."

GENERAL HISTORY.—It is designed to give the student a knowledge of the outlines of the world's history that may serve as a good foundation for further historical and literary work.

TEXT-BOOK—Myers' General History.

AMERICAN HISTORY.—An attempt is made to impart a knowledge of the causes and effects of the important events of history, rather than to fill the mind of the student with an undigested mass of detail. Especial attention is given to the history of our country under the constitution. The drawing of historic maps, recitations from topics assigned, and frequent written reviews, are important features of the work.

TEXT-BOOK—Barnes' Brief History of the United States.

CIVIL GOVERNMENT.—The text-book now in use (Young's Class Book) gives an analysis of the Constitution of the United States, presents a comparative view of the different State governments, treats of county and township organization, and affords an acquaintance with such principles of law as are involved in ordinary business transactions.

POLITICAL ECONOMY.—Practical exercises constitute an important feature of the text-book used. No attempt is made to inculcate any particular economic doctrine, but it is sought to give the student such an understanding of the principles of the science that he may apply them intelligently to the solution of such questions as may come under his consideration.

TEXT-BOOK—Chapin's First Principles of Political Economy.

MATHEMATICS.

Prof. RICHARDS, Mr. WILKINS and Mr. DEAN.

The Academic course in Mathematics begins with Higher Arithmetic, and is continued through Algebra and Geometry. To Arithmetic one term is devoted; to each of the last, two. Students who can produce satisfactory evidence of a sufficient knowledge of Arithmetic will not be required to pursue that study. The object of the course is to give the student a comprehension of the principles involved in the elementary branches and a thorough acquaintance with their immediate application. The solution of original problems, so valuable both as an exercise and a test of acquirement, is made a prominent feature of the course.

In Arithmetic the vital principle and not the mere mechanical rule is what is sought to be inculcated, and the working of examples is a means not an end. Incidentally short methods of multiplication and division are introduced and insisted upon. In Algebra, the course begins with the fundamental operations and extends through Quadratic Equations and the Progressions. The class in Geometry completes the usual course in old Geometry, Plane and Solid.

Each class meets daily (five times a week) for one hour.

The text-books and scheme of work are as follows:

FIRST YEAR.

First term.—Arithmetic, Barnes' National. Algebra, Wells' Academic to Simple Equations containing more than one unknown.

Second term.—Algebra, Wells' Academic, completed.

SECOND YEAR.

First term.—Geometry, Wells' Plane and Solid, first four books.

Second term.—Geometry, Wells' Plane and Solid, completed.

The preparation necessary for this course is a good knowledge of Arithmetic to Percentage; at the same time some acquaintance with Algebra will greatly facilitate progress.

SCIENCE.

BOTANY.—The course comprises the elements and principles of descriptive and systematic Botany, together with occasional lectures on the economic uses of various plants. The student is required to begin the analysis of plants as soon as they begin to bloom in the spring, and to continue analyzing till the end of the term. Frequent botanical excursions by the class are insisted on for the purpose of familiarizing the student with the haunts and habits of all the common plants of the vicinity.

TEXT-BOOK—Gray's School and Field Book.

CHEMISTRY.—The design of this course is to acquaint the student with the most important facts and principles of the science without going into minor details. Instruction is given by lectures, illustrated by means of experiments, and by recitations based upon the subject-matter contained in Norton's Elements of Chemistry, Revised Edition. The class meets five times each week throughout the second term.

PHYSIOLOGY.—It is aimed to make the instruction in this branch as practical as possible, and to lead the student to obey the injunction, "Know Thyself." Hints on Hygiene are given, also rules for action in cases of emergency.

TEXT-BOOK—Steele's Hygienic Physiology.

PHYSICS.—In this course the object constantly held in view is to present simply and plainly the fundamental truths of Natural Philosophy; to define clearly the nature of force and of motion, and the laws which they obey; and to teach the student to apply these laws to the solution of such simple problems of statics and dynamics as relate to common and familiar phenomena. The subjects of sound, light, heat and electricity are introduced upon a scientific basis, and are illustrated throughout the course by experiments. The department is supplied with apparatus of all kinds necessary for this purpose. For academic students the course extends through the first term of the second year.

PHYSICAL GEOGRAPHY.—In this branch attention is directed to the causes of natural phenomena. Meteorology and the signal service receive special attention.

TEXT-BOOK—Guyot's Physical Geography.

BOOK-KEEPING.—This study is not required, but will be taught upon the application of at least five students for instruction therein. The course comprises principally Double Entry. Various kinds of business are represented, and all the modern conveniences and auxiliaries are explained and used. The student is required to finish at least six different sets of books. Those who complete these before the end of the term will be furnished with abundant material for further practice.

PREPARATORY COURSE.

This course of study is maintained for the benefit of those students who find it necessary to give themselves special preparation for the advanced courses. The completion of this course admits the student to any of the advanced courses without examination.

CHEMISTRY.—This course is intended to prepare Technical students for Laboratory work, which begins in the second year. Norton's Elements of Chemistry, Revised Edition, is the text-book used. The class meets five times each week.

PHYSICS.—In this class, which meets five times each week throughout the year, the foundation is laid for the course in Mechanics of the Technical Department. The fundamental ideas and laws of force, motion, energy and work are dwelt upon at length, and great care is taken to convey to the student correct and sound notions on these important points. The subjects of sound, light, heat and electricity are then taken up, the laws which they obey given and explained simply and clearly. A prominent feature of the course is experimental illustration, for which purpose the equipment in apparatus is excellent.

MATHEMATICS.—A thorough knowledge of elementary Algebra and Geometry is absolutely essential to any successful prosecution of the higher branches of Mathematics, and this course is framed to give those who are insufficiently prepared in these subjects an opportunity to obtain the requisite acquaintance with them. The studies of the first year and the text-books used are the same as those already laid down in the Academic Department (p. 128). The special feature of the second year's work is an extended course in Algebra. This will include a hurried review of the elementary processes, a wider discussion of problems leading to equations, with the interpretation of their results, Theory of Exponents, Surds, Imaginaries, the Progressions, Permutations and Combinations, Binomial Theorem, Series, Logarithms, Theory of Numbers, with an introduction to the Theory of Equations.

TEXT-BOOKS—Wells' University Algebra, with lectures.

At the same time, the class takes a thorough course in the old—Euclidian—Geometry, with numerous original exercises. Text-book, Wells' Plane and Solid Geometry.

This is recognized as an important period in the student's work, and every effort is made to have him acquire that firm basis without which his subsequent superstructure cannot be stable. His attention is called to the logical processes involved in the demonstrations, and an attempt is made to have him apply the same rigorous methods to his own thought. Principles learned are constantly illustrated and impressed by requiring their application to the solution of problems. Incidentally the student is acquainted with the noteworthy facts in the origin and development of the subject which he is studying.

GENERAL INFORMATION.

BUILDINGS AND EQUIPMENTS.

The buildings of the School of Mines are situated in the most elevated part of the city of Rolla. They are substantial brick structures, well ventilated and lighted, and heated by the best furnaces manufactured. The main building has recently been painted and calcimined throughout, and the laboratory, one of the most complete in the country, has been in use but four years.

The different departments of the School are well supplied with apparatus. Several hundred dollars have been expended this year in the purchase of instruments and apparatus for the Engineering and Chemical departments, and further purchases will be made as additional needs are felt and the financial condition of the school will allow.

The last General Assembly appropriated five thousand dollars to the School of Mines for a mess club-house. The building is now completed and contains commodious and comfortable rooms for thirty young men. The dining hall and culinary department accommodate twice that number. The students in the building form themselves into a club, and employ their own caterer. In this manner it is believed they will be able to board themselves at comparatively low cost.

Students wishing to engage rooms in the club building for the session of 1891-92 should do so before September 1, 1891, as the supply of rooms will soon be exhausted. Two students occupy one room. Students engaging rooms on or before September 1, should send \$5 to treasurer of the College in order to secure assignment to room. This will be refunded on occupation or failure to do so, and is merely required as evidence of good faith in requesting reservation of a room. The club will be organized immediately at the beginning of the session.

LIBRARY.

The library contains 2,100 volumes. There have recently been added about four hundred volumes on Engineering, Mathematics, Chemistry and Metallurgy. The library is now supplied with the latest works on these subjects, and any student who may wish to pursue an extended course of reading in connection with his class work has here an ample opportunity. There are also the standard works in English and American poetry, fiction, biography, and history, provided with especial view to the needs of Academic students. About twenty Engineering, Mathematical, and Chemical Journals, domestic and foreign, are kept on file for the use of Faculty and students.

The library is open at regular hours, and all students of the institution may use the books, under certain regulations.

EXAMINATIONS.

Students applying for the degrees led to in courses I to V inclusive, must stand examinations on the elements of Algebra and Geometry before being admitted to the work of those courses.

This examination is only intended to test the student's fitness for this advanced work. No entrance examinations are held for admittance to the School of Mines.

Besides the daily oral examination upon the previous lecture, two general written examinations of each class are held during the session, which every number is required to stand. The Intermediate Examination occurs near the middle of the session, and is upon the subjects of instruction of the first part of the course. The Final Examination occurs near the end of the session, and is upon the subjects of instruction of the second part of the course only, or upon those of the entire course. These examinations are conducted in writing. The questions have numerical values affixed. If the answers at any general examination amount in value to three-fourths of the aggregate value of the questions, a distinction is awarded to the student, and the fact is published at the close of the session. Examinations for Proficiency or for Graduation coincide with the Intermediate and Final Examinations.

The written examinations are conducted in each school by the Professor. They are sufficiently comprehensive and difficult to render it impossible for a student, without steady diligence, to attain a Distinction, and candidates for Proficiency or for Graduation are subjected to searching interrogations on the details as well as on the general principles of the subject, and are expected to be accurately versed in all matters treated in the lectures and correlative text. Moreover, the student's command of English, and his standing at both daily and general examinations, are taken into account in estimating his qualification for the certificate or diploma.

DEGREES.

A Certificate of Distinction is conferred on one who has attained three-fourths of the value of the questions at an Intermediate or Final Examination. For the degrees of Proficient or Graduate, an equal or higher standard is demanded; these degrees, which are conferred only on examination, are as follows:

UNTITLED DEGREES.

1. A Certificate of Proficiency is conferred on one who has passed examination on any of the following special courses: Geology and Mineralogy, General Chemistry, Fire Assaying, Botany and Zoology, Elementary Physics, Geodesy, the Academic course and the Preparatory course.
2. A Diploma of Graduation is conferred on one who has passed examination on any of the following general courses: Mathematics, Physics, Analytical Chemistry, Engineering and Assaying.

SCIENTIFIC DEGREES WITH TITLES.

1. The degree of Bachelor of Science in Mathematics and Physics is conferred on one who has passed examination on all of the subjects of instruction in the Course of Mathematics and Physics.
2. The degree of Bachelor of Science in Chemistry is conferred on one who has passed examination on all of the work of the special Chemical Course.
3. The degree of Bachelor of Science in General Science is conferred on one who has passed examination on all of the prescribed subjects of instruction in the General Course.

PROFESSIONAL DEGREES WITH TITLES.

1. The degree of Bachelor of Science in Civil Engineering is conferred on one who has passed examination on all of the subjects of instruction in the Civil Engineering Course.
2. The degree of Bachelor of Science in Mining Engineering is conferred on one who has passed examination on all of the subjects of instruction in the Mining Engineering Course.
3. The degree of Bachelor of Science in Mechanical Engineering is conferred on one who has passed examination on all of the subjects of the Mechanical Engineering Course.
4. The degree of Civil Engineer, Mining Engineer or Mechanical Engineer is conferred on one who has graduated in Civil, Mining or Mechanical Engineering, and received the Bachelor's Degree therein, and who has identified himself with the profession during a period of not less than three years, and who during that time has demonstrated by work his fitness for his chosen profession.

COMMENCEMENT.

The annual Commencement exercises are held in the Assembly room, at the close of the work in June. The exercises consist of an address by some prominent speaker, the conferring of degrees and granting of diplomas by the Director, and an essay or oration by some member of the graduating class.

Last year the address was delivered by Mr. Lee Meriwether, Labor Commissioner of Missouri.

EXPENSES.

The necessary expense for the session of nine months in the School of Mining is as follows :

Matriculation, payable on entrance.....	\$10 00
Library fee payable on entrance.....	4 00
Board, including fuel, washing, lights, etc	\$95 00 to 135 00
Total	109 00 149 00

The cost of books and stationery (too variable to be introduced into a general estimate) may be assumed to average \$10.00 during the session.

All laboratory students furnish their own blowpipes, platinum, silver and gold solutions, crucibles, and apparatus, and pay for gas and fuel consumed and for apparatus damaged or destroyed. A deposit of five dollars per term, covering the value of the apparatus and chemicals issued, is required to be placed in the hands of the Treasurer by each laboratory student. This deposit, less the value of material consumed, is returned at the close of the year.

It is believed that mess-club students will be able to cover the expenses of board, lodging, washing, lights and fuel with \$10.00 per month ; students boarding in the city pay from \$12.00 to \$15 00 per month .

An abatement of one-half the fees for Matriculation and Library is made to students who enter after 1st of January.

MONTHLY REPORTS.

Regular monthly reports are sent to the parent or guardian of each student, showing the student's grade in scholarship for the month, and giving such other information in regard to his progress, attendance, etc., as may be thought to be of interest. The attention of parents and guardians is particularly called to these reports.

The Missouri School of Mines now offers advantages which it has not been able to offer before in way of accommodation and thoroughly organized system of scientific work. The increase in the number and grade of its students the past two years is evidence of a higher appreciation of its work, in both Missouri and neighboring states. Every effort is being put forth by all connected with the institution to make it fulfil the purpose of its establishment: *i. e.*, to furnish thorough instruction in Mechanical, Mining and Civil Engineering, and to fit young men of Missouri for the industrial pursuits.

SCHEME OF LECTURES, PROFESSIONAL COURSES.

	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.
9-10	Jr. Chemistry. Int. Eng.	Sr. Metallurgy. Int. Eng.	Jr. Chemistry. Int. Eng.	Sr. Metallurgy. Int. Eng.	Jr. Chemistry. Int. Eng.
10-11	Jr. Math. Int. Chem. Tech. Sr. Civ. Eng.	Jr. Math. Min. and Geo. Sr. Mining Eng.	Jr. Math. Int. Chem Tech. Sr. Civil Eng.	Jr. Math. Min. and Geo. Sr. Mining Eng.	Jr. Math. Int. Chem. Tech. Sr. Civil Eng.
11-12	Jr. Eng. French. Int. Math.	Jr. Eng. French. Sr. Math.	Jr. Eng. French. Int. Math.	Jr. Eng. French. Sr. Math.	Jr. Eng. French. Int. Math.
2-4	Drawing. Laboratory. Field Work.	Drawing. Laboratory. Field Work.	Drawing. Laboratory. Field Work.	Drawing. Laboratory. Field Work.	Drawing. Laboratory. Field Work.

TIME TABLE FOR THE ACADEMIC AND PREPARATORY COURSES.

FIRST TERM.

9-10	10-11	11-12	1-2	2-3	3-4
French (first year). German (first year). Algebra (second year). Algebra (first year).	English Literature. Arithmetic.	U. S. History. Physics.		French (second year). German (second year).	English History. English Grammar. Geometry.

SECOND TERM.

French (first year). German (first year). Algebra (second year). Algebra (first year).	Civil Government (half hour). Political Economy (half hour). Physics.	General History. Physical Geography (half hour). Physiology (half hour). Chemistry.	Book-keeping.	French (second year). German (second year).	Rhetoric. Botany. Geometry.
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SCHEME OF EXAMINATIONS.

INTERMEDIATE EXAMINATIONS FOR 1892.

Algebra, Junior Engineering, Mineralogy.....	Monday, January 25	25
Metallurgy, German, English Literature and Arithmetic.....	Tuesday, "	26
French, General Chemistry, Chemical Technology and History.....	Wednesday, "	27
Intermediate Engineering and Geometry.....	Thursday, "	28
Junior Mathematics and Physics.....	Friday, "	29
Intermediate Mathematics, Zoology, and Senior Engineering.....	Saturday, "	30

FINAL EXAMINATIONS FOR 1892.

French.....	Monday, June 1	1
Metallurgy, German, Civil Government and Political Economy.....	Tuesday, "	2
General Chemistry, Chemical Technology and History.....	Wednesday, "	3
Intermediate Engineering, Geometry and Physical Geography.....	Thursday, "	4
Junior Mathematics, Physics, Rhetoric.....	Friday, "	5
Intermediate Mathematics, Senior Engineering, Botany and Physiology.....	Saturday, "	6
Algebra, Junior Engineering and Geology.....	Tuesday, "	9

CALENDAR.

1891.

June 11, Thursday, 10 a. m.....	Annual Commencement.....
September 14, Monday.....	First Term begins.....
September 14 and 15.....	Entrance Examinations.....
December 18, Friday.....	Christmas Holidays begin.....

1892.

January 5, Tuesday, 9 a. m.....	Exercises resumed.....
January 25, Monday.....	Examinations begin.....
January 30, Saturday.....	Examinations close.....
February 2, Tuesday, 9 a. m.....	Second Term begins.....
June 1, Monday.....	Final Examinations begin.....
June 9, Tuesday.....	Final Examinations end.....
June 11, Thursday, 10 a. m.....	Annual Commencement.....

GRADUATES.

1874.

John W. Pack, M. E.—Assistant Assayer, U. S. Mint, San Francisco, Cal.

Gustavus H. Duncan, C. E.—Boulder, Colo.

* John H. Gill, C. E.—U. S. Engineering Department, Washington, D. C.

1875.

Almon W. Hare, M. E.—Chemist and Assayer, Aspen, Colo.

Francis J. Deegan, C. E.—Engineer Louisville, New Orleans and Texas Railway.

1876.

John E. McGrath, C. E.—Sub-assistant, U. S. Coast and Geodetic Survey, San Francisco, Cal.

William C. Minger, M. E.—Assayer and Chemist, Pueblo, Colorado.

Cyrus H. Emerson, C. E.—Denison, Tex.

Oscar E. Garvens, M. E.—Lead City, Dakota.

John D. Greason, M. E.—Assistant Engineer and Right-of-Way Agent, D., M. and A. R. R.

1877.

A. H. Ohmann-Dumesnil, M. E.; M. D. St. Louis Medical College, '80.—Since '83, Professor of Dermatology and Syphilography, St. Louis College of Physicians and Surgeons. Vice-President of Ninth International Medical Congress, '87.

James A. Pack, M. E.—Assayer, Butte City, Montana.

* Thomas H. Milsaps, C. E.

1878.

Wilton R. Brown, M. E.—Assayer for Shakespeare Gold and Silver Mining Co., Shakespeare, New Mexico.

Lee R. Grabill, M. E.—Assistant Engineer, U. S. River and Harbor Improvement, Washington, D. C., and Fredericksburg, Va. Superintendent of Battery Station, U. S. Fish Commissioner, Havre De Grace, Maryland, '85-6.

William Y. Bean, C. E.—Engineer Missouri Pacific Railway.

* Lindsay L. Coppedge, C. E.—Engineer Missouri Pacific Railway.

1879.

Charles F. Winters, M. E.—Assayer, New Mexico.

Rudolph C. Hoyer, C. E.—Draughtsman, U. S. Engineer's office, Memphis, Tenn.

1880.

Arthur C. Carson, M. E.—Assayer, Butte City, Montana.

Lorin X. Smith, M. E., C. E.—Mining Engineer, Silver City, New Mexico.

1881.

Edward B. Summers.—Engineer Missouri Pacific Railway, '81. U. S. Topographical Survey, '86. Engineer Kansas City, Wyandotte and Northern Railway.

Walter Wishon.—Denver, Colorado.

1882.

- Frank W. Gibb, C. E., M. E.—Mining Engineer, Assayer and Chemist, Little Rock, Ark. Associate American Institute of Mining Engineers.
- W. R. Painter, C. E.—County Surveyor, Moberly, Mo.
- A. B. Schrantz, C. E.—Engineer Union Pacific Railway.
- H. N. Van Devander, C. E.—Engineer St. Louis and San Francisco Railway, '82-3. Engineer Anniston and Atlantic Railway, '83-4. Now Superintendent R. M. & M. Co.'s Iron Mines, Priors, Georgia.
- B. Ross, M. E.—Editor, Houston, Mo.

1883.

- Floyd Davis, C. E., M. E.; M. Sc., Adrian College, '84; Ph. D., Miami University, '88. Professor of Chemistry and Metallurgy, Virginia Agricultural and Mechanical College. '83-6. Lecturer on Assaying and Metallurgy, Dakota School of Mines, '87. Now Professor of Chemistry and Physics, Drake University; Chemist of Iowa State Board of Health; and non-resident Professor of Metallurgy, Wisconsin State University.

1884.

- Curtis Alexander, C. E., M. E.—Assistant Division Engineer Leavenworth, Northern and Southern Railway, '86-7. Chemist for U. S. Antimony Company, '87-8. Now Assayer and Chemist for Mexican Ore Company, Laredo, Texas.
- W. M. Claypool, C. E., M. E.—Chemist, Fairbank, Arizona
- P. C. Gallaher, M. E.—Assayer and Chemist, Leadville, '84-7. Sup't of Minnie Mine, Breckenridge, Colorado, '87-8. Now Assayer and Chemist, Aspen, Colorado.
- A. Neustaedter, M. E.—Office of President of Board of Public Improvements, St. Louis, Mo. Now Sup't of Ste. Genevieve Copper Works, Ste. Genevieve, Mo.
- Frank Wilson, C. E.—Engineer St. Louis and San Francisco Railway.

1885.

- *J. R. D. Owen, M. E.—Chemical Laboratory School of Mines.
- P. R. Van Frank, M. E.—Assistant Engineer Verdigris Valley, Independence and Western Railway.
- F. C. Wilson, C. E.—Resident Engineer Burlington and Northern Railway. Division Engineer Union Pacific Railway. Now Resident Engineer for Atlanta Bridge Co., Atlanta, Georgia.

1886.

- J. G. Martinez, M. E.—Assistant Chemist, Coahuila, Mexico. Now in the employ of the Mexican International Railway.
- Jay Cullens, C. E.—Engineer Union Pacific Railway.
- James E. Fulcher, C. E.—Draughtsman Missouri Pacific Railway, '86. Draughtsman St. Louis and San Francisco Railway, '87. Now Principal of Akinsville Normal and Commercial Institute, Akinsville, Mo.

1887.

- O. Lachmund, M. E.—Chemist for Western Steel Co., St. Louis, '87. Bullion Sampler for Holden Smelting Co., Denver. Now employed by Grand View Mining and Smelting Co., Rico, Colorado.
- M. W. Yeater, M. E.—Chemist for Western Steel Co., St. Louis, Mo., '87. Assayer for Gold King Mine, Telluride, Colorado. Now City Engineer, Sedalia, Mo.

G. W. Cole, C. E.—U. S. Coast Survey. Now Engineer Missouri Pacific Railway.
 George B. Wiles, C. E.—Engineer Missouri Pacific Railway. Now employed by
 St. Louis Bridge and Iron Company, St. Louis, Mo.
 Mary Kyle, Academic.—Teacher, Troy, Ohio.

1888.

Elizabeth Harrison, Academic.—At home, Rolla, Mo.
 Minerva G. Seay, Academic.—Teacher, West Plains, Mo.

1889.

Anielka Illinski, Academic.

1890.

George R. Dean, C. E.—Instructor in Mathematics and Physics, Missouri School
 of Mines.

*Dead.

XVIII. SCHOOL OF ENGINEERING.

J. S. BLACKWELL, A. M. PH. D.,
Chairman of the Faculty and Professor of French and German.

THOMAS JEFFERSON LOWRY, S. M., C. E., DEAN.
Professor of Civil and Topographical Engineering.

PAUL SCHWEITZER, PH. D.,
Professor of Chemistry.

WILLIAM B. SMITH, PH. D.,
Professor of Mathematics and Astronomy.

LIEUT. B. B. BUCK,
 (Detailed from Regular Army),
Professor of Military Science and Tactics.

ALEXANDER MARTIN, A. M., LL. D.,
Lecturer on Law of Contracts.

GEORGE D. PURINTON, A. M., PH. D.,
Professor of Economic Botany.

G. C. BROADHEAD, M. S.,
Professor of Geology and Mineralogy.

M. L. LIPSCOMB, A. M.,
Professor of Physics.

HIRAM PHILLIPS, TOP'L ENGINEER,
Assistant Professor of Engineering.

AUSTIN LEE MCRAE, SC. D.,
Assistant Professor of Physics.

GENERAL STATEMENT.

The School of Engineering is designed to furnish the students the means of acquiring a thorough knowledge, theoretical and practical, of those sciences and arts which are playing the most important parts in the development of the material resources of our country, and the advancement of our civilization.

Besides the application of the higher analysis to engineering investigation, the professional preparation of the students comprises the following subjects: The location and construction of roads, railroads, canals and water-works; the surveys and improvement of coasts, harbors, rivers and lakes; the determination of astronomical and geographical co-ordinates on land and at sea; the design and construction of roofs, trusses, girders and suspension bridges; drawing and constructing the various kinds of arches; the design, application and construction of wind, hydraulic and electric motors, dynamos, air and steam engines; blowpipe analysis of minerals and economic geology, mineralogy, chemistry, elementary and applied; the art of war; the preparation of the various kinds of projections and drawings used by the military, topographical, civil and mine engineer, and the selection, tests and application of materials used in construction, and papers and essays on professional subjects.

The sphere of the engineer is so broad and diversified that it is impossible for any one to become proficient in all the various specialties into which the profession has been so divided. To meet the demands for special engineering studies and training from the end of the third year of the studies laid down in the Engineering Synchronistic table (see page 147), three parallel courses have been arranged, so as to allow of option and diversity of special studies. This department will thus foster the development of special fitness in each student, by offering him work in the line of his preferences. These courses are:

I—Civil Engineering.

II—Topographical Engineering.

III—Electrical Engineering.

The great subdivisions of engineering which are embodied in these courses are road and railroad engineering, hydraulic engineering, bridge architecture and construction, topographical engineering (and, as prerequisite auxiliaries of these, engineering geodesy and practical astronomy), and electrical engineering.

The course in civil engineering is designed for those who wish to make either road and railroad engineering, bridge construction or river improvement a specialty.

The course in topographical engineering is arranged for those students who find distasteful the application of the higher mechanics to civil constructions, and who may show, instead, special aptitude for geodetic work and hydraulic engineering, viz.: Trigonometrical, topographical and geological surveying, practical astronomy on land, and the surveys and improvements of rivers, lakes, bays and coasts. Since the U. S. Government began the geodetic, topographical and geological surveys of her territories, and gave fresh impetus, by liberal appropriations, to the surveys of her coasts and the chain of great lakes on her north, there has been an incessant demand for men specially fitted for the important duties of the explorer, astronomer, topographer and geographical engineer. And now that the attention of the nation is turned to surveying and improving the great rivers of the Mississippi

basin, a broad field, inviting the labor of topographers, hydrographers and hydraulic engineers, is open at our doors. To provide for these and similar demands, the course in topographical engineering was instituted, and is now in full operation. The facilities for instruction in this course are very complete. Students taking the course in topographical engineering will have an opportunity and be required to perform work as accurately as is done in the actual details of the U. S. Coast Survey, the geodetic surveys of our lakes and territories, and the surveys and improvements of our rivers, lakes, bays, harbors and coasts by the U. S. A. Engineer Corps. The course in Military Engineering is essentially that of the U. S. Military Academy at West Point.

The Electrical Engineering course has been established to meet the wants of young men desirous of entering upon the rapidly developing field of the applications of electricity to the arts. Its leading studies are physics, especially theoretical and applied electricity, mechanics, mathematics and chemistry. The course is made strong in mechanical engineering and mathematics, because in many branches of electrical engineering a sound and practical knowledge of mechanics, measurements of power and its transmission is essential.

We especially ask the attention of those young men who desire to fit themselves for the duty of county surveyor and of government land surveyor, to the fact that every effort will be made to enable them to accomplish this within a short time. To this end, at the beginning of each year, a class will be organized and instructed (theoretically and practically) in land surveying, with compass, theodolite and solar compass; in the surveys for and location and construction of roads, and in the surveys for and location of, and in the designs for and construction of, wooden bridges, and in locating and surveying base lines, meridians, and township and section lines, and in retracing old government, township and section lines. This class will also be instructed in drawing. This course can be completed in thirty-eight weeks. A certificate of proficiency will be given those who complete this course.

The Professor of Engineering is the sworn deputy of the county surveyor of Boone for the corporate limits of the city of Columbia, and hence, the surveys he here makes are legal; they are accurately made, carefully computed and platted, and properly recorded on the records of the county.

INSTRUCTION IN ENGINEERING.

The methods of instruction embrace the use of text-books, lectures (illustrated by diagrams of the great engineering and surveying operations and results of the present age), and actual field and observatory practice. The field and observatory practice and work in the chart-room are made to bear a large proportion to the theoretical instruction. The data thus obtained by actual field surveys and practice in the observatory serve both to elucidate the principles and formula, and insure their ready and accurate application in professional life.

In addition to the field, class-room, observatory and chart-room work, the engineering students have access from 8 a. m. to 5 p. m., each day, except Sunday, to the University library, and also to the private library of the Professor of Engineering, which together contain nearly all the standard works on surveying, engineering, geodesy and astronomy. These they are expected to make constant use of, and thus enlarge, by careful reference and judicious reading, their acquaintance with the subjects presented in the text-books and lectures.

We desire to call special attention to the increased facilities which this University now enjoys for teaching astronomy. It offers facilities for instruction in theoretical and practical observatory and sextant astronomy, equal to any in the

United States. The most refined astronomical methods of the U. S. engineer corps and the U. S. coast survey are taught by the Mathematical and Engineering departments. With these facilities, young men can prepare themselves for efficient service on the astronomical parties of the great geodetic surveys of our states and nation ; and can also acquire the nautical astronomy required in navigating a ship.

Our present professional force, and the increased facilities in apparatus and laboratories, are such that we can now offer a complete theoretical and practical treatment of the above great subdivisions of Engineering, Surveying and Astronomy.

The first three years of the courses in Civil and Topographical Engineering.		Hours.	The first three years of the course in Electrical Engineering				
SOPHOMORE YEAR.							
Sem' r.	Hours.	III. VI.	Calculus.....	4	IA.	Calculus.....	5
			Advanced Physics.....	4	I.	Electricity and Magnetism.....	5
			Physical Laboratory.....	4		Drawing.....	5
			Applied Chemistry.....	2		Physical Laboratory.....	3
			Drawing.....	2		<i>Options:</i>	3
			Economic Geology (till May 1).....	3		Chemistry.....	5
			Field Work.....	2		English and Sociology.....	5
						French.....	5
			Calculus.....	4	IA.	Calculus.....	5
			Mechanics.....	5	IV.	History of Physical Science.....	5
V.	II. IV.		Physical Theory.....	3		Mechanics.....	5
			Chemical Laboratory.....	2		Chemical Laboratory.....	2
	I.		Roads, Streets and Pavements and Field Work.....	2		<i>Options:</i>	2
			Drawing.....	2		Higher Surveying.....	5
	III.		Geology.....	3		English.....	5
						French and Political Economy.....	5
			Analytical Geometry and Determinants.....	5		German.....	5
			Mineralogy.....	4	II.	French.....	3
IV.	VI. IV.		Chemical Laboratory.....	2	IV.	Advanced Physics.....	3
			Drawing.....	4	V.	Analytical Geometry and Determinants.....	3
	I.		Land Surveying and Land Law.....	5	VI.	Chemical Laboratory.....	2
	VI.		Analytical Geometry and Determinants.....	3	II.	German.....	5
			Physical Laboratory.....	2	III.	Chemical Philosophy.....	4
	III.		Chemical Theory.....	4	IV.	French.....	3
			Chemical Laboratory.....	2	VI.	Analytical Geometry and Determinants.....	3
III.	I.		Land Surveying and Navigation.....	5		Physical Laboratory.....	3
			Drawing.....	4		Drawing.....	3
	V.		Geometry, Trigonometry and Algebra.....	5	II.	Chemistry.....	5
			Chemistry.....	5	IV.	Composition and Rhetoric.....	5
II	II. IV.		*German 5, or French 4.....	5	V.	Geometry, Trigonometry and Algebra.....	5
			English Composition and Rhetoric.....	2	VI.	German.....	5
			Drawing.....	3		Drawing.....	3
FIRST YEAR.	V.		Geometry, Trigonometry and Algebra.....	5	II.	Physics.....	5
			Physics.....	5	IV.	Composition and Rhetoric.....	5
	II.		*French 4, or German.....	5	V.	Geometry, Trigonometry and Algebra.....	5
			English Composition and Rhetoric.....	2	VI.	German.....	5
	I.		Drawing.....	3		Drawing.....	3

*Either two Semesters of German or two Semesters of French are required.

NOTE.—While the student is pursuing the first three years of the Engineering courses, the tuition is \$20 per year; the last two years, \$40 per year.

ENGINEERING: TABLE OF SYNCHRONISTIC CURRICULA.

Semester	Course in Civil Engineering. C. E.	Hours	Course in Topographical Engineering. Topographical Engineer.	Hours	Course in Electrical Engineering. E. E.
X	Project and Thesis 1-2. Assaying 1-2. Law of Contracts 1-2. Designing Structures. Hydraulic Engineering (rivers, harbors and water-works). Sextant Astronomy.	III IV III II V	Project and Thesis. Drawing, Room and Field Work. Law of Contracts 1-2. Geodesy. Hydraulic Engineering (rivers and harbors).	III IV	Machine Design..... 5 Electrodynamics..... 5 Original Research and Thesis..... 5 <i>Options:</i> Modern Higher Algebra..... 3 Mathematical Electricity and Magnetism... 5 Advanced Physics, Memoirs, etc..... 5
	Hydrographical Surveying 1-3. Logic 1-3—Economic Botany (timber) 1-3. Steam Engine Framed Structures Isometric Projection and Stereotomy. Least Squares 1-2—Differential Equations.	V I IV III II	Logic 1-3—Field Work 2 3. Navigation, Maritime and Coast Surveying. Triangulation and Topographical Surveying (with plane table, also with transit and stadia.) Magnetic and Meteorological Surveying. Chart Projections 1-2—Colored Topography 1-2.	III IV	Machine Design..... 5 Steam Engine..... 2 Specifications and Contracts..... 2 Original Research..... 5 <i>Options:</i> Modern Higher Algebra..... 3 Mathematical Electricity and Magnetism... 5 Theory of Potential..... 5
VIII	Map Drawing and Field Work. Shades, Shadows and Perspective, with Draughting. Applied Mechanics (Kinematics and Dynamics). Topographical Surveying (Transit and Stadia). Work in Testing Laboratory	I III IV	Map Drawing and Field Work. Shades, Shadows and Perspective, with Draughting. Spherical Astronomy. Hydrographic Surveying 3-4—Sextant Astronomy 1-4.	I III II	Shades, Shadows and Perspective..... 5 Applied Mechanics..... 5 Technical Applications of Electricity..... 5 Thesis..... 2 <i>Options:</i> Differential Equations..... 3 French..... 3 Astronomy..... 3
	Applied Mechanics (Theory of stress and of the strength and elasticity of materials.) Descriptive Geometry and Draughting. Higher Surveying. R. R. Surveying and Engineering.	III I IV V	Topographical Drawing and Field Work. Descriptive Geometry and Draughting. Least Squares 1-2—Theory and Adjustment of Instruments $\frac{1}{2}$ Leveling and R. R. Surveying.	I III II IV	Descriptive Geometry and Draughting..... 5 Applied Mechanics..... 5 Dynamo-Electric Machinery..... 5 Thermodynamics..... 3 <i>Options:</i> Differential Equations..... 3 French..... 3 Magnetic Surveying..... 3

SENIOR YEAR.

JUNIOR YEAR.

THE TESTING LABORATORY.

The testing machine manufactured by Tinius Olsen & Co., of Philadelphia, is now in successful operation in the basement of the west wing of the University. The capacity of this machine is 200,000 pounds; and it is arranged to be operated either by power or by hand. It is adapted to testing materials in compression, tension, torsion, shear and cross-breaking; and has an automatic register which records the elastic limit, the breaking stress, and the elongation due to each stress during the entire experiment. This is the first automatic register which has left Mr. Olsen's shop.

This testing machine is expected to serve a three-fold purpose, viz.:

First—For the use of the Junior and Senior students, in connection with their studies on the strength and constitution of all kinds of engineering materials, as iron, steel, brass, stone, wood, etc.

Second—To test the materials used in the highway bridges and other public structures in Missouri, and thus protect a too confiding public against the melancholy disasters and financial losses which defective building materials too often bring down upon the people of the State.

Third—To ascertain and publish to the world the strength and other qualities of the building stones, woods, iron, etc., of Missouri. This engineering school and the departments of Geology and Chemistry are now actively engaged in collecting specimens of the building stones, irons, coals and woods of every county of the State, and also the estimated quantities of said materials.

These will be tested carefully and accurately in the laboratories and the results published; thus we hope to give to the world an accurate knowledge of the great natural resources of Missouri, and thus assist idle capital to discover the resting places of the undeveloped wealth of this great State. We hope the students and graduates of the University, and especially the county surveyors and engineers of the State, and also the owners of the mines, quarries and woodlands of Missouri will lend us their earnest assistance in securing specimens of the building stones, cements and woods, and also the coals of every county and township of Missouri; the stone specimens should be 4-inch cubes, the specimens of woods one and one-half inches by one and one-half inches by 40 inches ($1\frac{1}{2}$ in. x $1\frac{1}{2}$ in. x 40 in).

The testing Laboratory also contains Olsen's latest improved cement testing machine. This is used to test, under varying conditions, the different kinds of hydraulic cements. There is also in the laboratory a Corliss engine of 35-horse power which supplies all the motive power necessary for the large testing machine.

"The James S. Rollins Engineering Scholarship" of \$50 will, on the first day of June of each year, be awarded to that member of the Junior class in Civil Engineering "who shall be adjudged entitled to it by the President and Faculty." For conditions of award see article: "James S. Rollins University Scholarship," (page 159.)

REPORT.

The following is the report of the Engineering department for the year ending June, 1891:

Senior class	8
Juniors, Sophomores and Freshmen	47
Total in the Engineering course	55
Candidates for certificate of surveyor	17
Academic and Law and Medical students who took land surveying	11
Academic and Agricultural students who took drawing	8
Total number in the Drawing classes	62

ENGINEERING STUDENTS.

SENIORS.

Name.	Name.	Name.
Axtell, O. N.	Ellis, A. P.	McKean, L. B.
Bonfils, C. A.	Haley, J. L.	Shinkle, S. W.
Cauthorn, W. B.	Hall, W. F.	

JUNIORS, SOPHOMORES, FRESHMEN.

Name.	Name.	Name.
Balthis, F. S.	Fellows, J. N.	May, H. W.
Biggs, L. A.	Ficklin, F. A.	Nixon, A.
Burlington, S. A.	Fyfer, J. K.	Osborn, O. S.
Burkhart, L. H.	Garnett, J. P.	Ray, O. F.
Cauthora, E. R.	Gary, J. A.	Schneko, Robert.
Chambers, A. S.	Gordon, W. E.	S-isor, M. A.
Clack, J. M.	Grady, W. K.	Shawhan, D. S.
Crecelius, S. F.	Hatcher, M. S.	Thompson, T. W.
Danforth, H.	Helgler, H. L.	Thompson, B.
Davis, T. E.	Hill, Curtis.	Timberlake, E. M.
Dent, L. L.	Hockaday, C. E.	Tolbert, C. M.
Dinsmoor, Gordon.	Hunter, W. C.	Truitt, Clarence.
Dodson, A. E.	Johnson, E. R.	Vaughan, R. E. L.
Duncan, Jesse	Lockwood, M. H.	Wentworth, O. F.
Ellis, W. A.	Locker, Geo. E.	Wylie, C. M.
Faris, J. C.	May, D. A.	Yowell, B. J.

The classes in topographical surveying and engineering have, by frequent practice in the field, familiarized themselves with the use of the theodolite, sextant, spirit and water-levels, leveling rods, chain and compass, and plane-table. And the class in surveying, by frequent practice in the field, have familiarized themselves with the use, manipulation and capabilities of the theodolite, compass and chain, and leveling rods and spirit levels, and the solar compass.

The energy, enthusiasm, painstaking care and accuracy displayed by these classes have confirmed me in the opinion previously formed from observation and experience of seven years with field officers of the U. S. Coast survey and navy, that the American mind possesses a fertility of resources, a power of adapting means to ends, and an acuteness of perception, which peculiarly fit it for an observer in the exact arts.

The Engineering school has a room fitted up with apparatus for taking copies of drawings by the "Blue Print process."

Drawing has been made a more prominent feature of the course; Warren course in Drawing, and Smith on Topographical Drawing, are used as texts.

The course in Topographical Engineering has been strengthened by giving greater prominence to the subject of Hydrographic Surveying and Hydraulic Engineering.

The various laboratories and departments of the Engineering school are supplied with the necessary modern apparatus for successful practical instruction in the various branches of the engineering profession.

The wisdom of the Board of Curators in providing an assistant professor of Engineering to devote his entire time to work in the Engineering school, is shown in the increased efficiency of the engineering students in drawing-room and field work.

The fact that we have been able to secure positions (on the surveys and improvements of the Mississippi and Missouri rivers, on the coast survey, on railroad

surveying and engineering parties, on bridge engineering, and on government land surveying parties) for the graduates from this department, has assisted materially in awakening an intelligent interest—a healthy enthusiasm—in the cause of engineering education at this University. And the present revival in the industries which demand engineering, electrical and chemical skill has already increased, and promises to further increase, the number of students in this department.

THOMAS J. LOWRY,

Dean of Engineering Sechool.

XX. MISSOURI STATE MILITARY SCHOOL.

Second Lieut. B. B. BUCK,

16th U. S. Infantry, Professor of Military Science and Tactics.

An officer of the regular army is detailed by the War department as Professor of Military Science and Tactics at the Missouri State University to carry out the provision of the act of Congress of 1862, which, in endowing this and similar institutions, stipulates that military tactics shall be taught.

During the year now drawing to a close 175 cadets have received instruction in this department. The cadets are organized in a battalion of four companies and a band, as follows :

<i>Battalion Staff and Non-Commissioned Staff.</i>	
Cadet First Lieut. and Adjutant.....	J. P. White
Cadet Second Lieut. and Quartermaster and Commissary.....	W. R. Littell
Cadet Sergeant Major	A. S. Holmes
Cadet Quartermaster Sergeant.....	E. R. Johnson
Cadet Color Sergeant.....	R. L. Kurtz
Cadet Drum Major	B. M. Thompson
Cadet Commissary Sergeant	F. W. Neidermeyer
<i>Company A.</i>	
Cadet Captain	G. C. Pratt
Cadet First Lieutenant	G. F. Whitsett
Cadet Second Lieutenant.....	C. G. Haines
Cadet First Sergeant	N. T. Adams
<i>Company B.</i>	
Cadet Captain	J. B. Sterling
Cadet First Lieutenant.....	H. L. Moore
Cadet Second Lieutenant.....	C. H. Grace
Cadet First Sergeant	H. J. Groves
<i>Company C.</i>	
Cadet Captain	S. F. Crecelius.....
Cadet First Lieutenant.....	A. J. McCulloch.....
Cadet Second Lieutenant.....	(Vacancy)
Cadet First Sergeant	C. M. Howell
<i>Company D.</i>	
Cadet Captain	W. M. Banks
Cadet First Lieutenant.....	(Vacancy)
Cadet Second Lieutenant.....	J. J. Duncan
Cadet First Sergeant	C. A. Keith

Those cadets are appointed to office who show ready obedience, zeal and capacity in the discharge of military duty. The Governor of Missouri issues commissions to all commissioned officers of the Cadet Battalion.

GENERAL SUPPLIES.

One hundred and fifty Springfield cadet rifles of the latest model, two 3-inch rifled field guns with carriages and implements, and a suitable amount of ammunition and target materials, are furnished by the General government. The State supplies ammunition, camp equipage, utensils, etc.

UNIFORMS.

Cadets wear but one style of uniform, known as the undress or fatigue uniform. Uniforms must be worn at all military exercises, and may be worn on all occasions. Arrangements have been perfected by which tailor-made uniforms are supplied to volunteer cadets at an aggregate cost of seventeen dollars (\$17) each, including caps and gloves. The State will supply two complete uniforms to each regularly appointed cadet free of cost. U. S. Regulation Infantry overcoats will be issued for the use of cadets. The 36th General Assembly made for this school a special appropriation of \$5,000, which will be used in providing these uniforms. This money, together with the Cadets' *pro rata* of supplies from the General government to the militia of this State, will enable the department to supply uniforms of the very best material and make.

COURSE OF INSTRUCTION.

FIRST YEAR—SECOND CLASS.

Practical instruction in the Schools of the Squad, Company and Battalion (Infantry), and in skirmish drill.

Practical instruction in rifle firing, 100, 200, 300 and 400 yards.

Practical instruction in the duties of camp life, embracing guard duty, camp policing, camp discipline, etc.

Recitations in Infantry Tactics through the School of the Company, Skirmishers, Ceremonies of Guard Mounting, Dress Parade, Inspection, Review and Muster.

Recitations in guard duty, rifle firing and cadet regulations.

SECOND YEAR—FIRST CLASS.

Practical instruction in the Schools of the Company and Battalion, and in Skirmishing.

Practical instruction in the service of field guns (foot battery), with mechanical manoeuvres.

Practical instruction in rifle firing, 100, 200, 300 and 400 yards.

Practical instruction in the duties of camp life, embracing guard duty, camp policing, camp discipline, messing, etc.

Practical instruction in Military Signaling.

Recitations in Infantry Tactics, School of the Battalion.

Recitations in Artillery Tactics, Manual of the piece, dismounted.

Recitations in the Elements of the Art of War.

Recitations in the Elements of Field Fortifications.

Lectures on Army Organizations, The Army of the U. S., The Regulations of the U. S. Army, The Regulations of the National Guard of Missouri, Courts Martial and Military Law and the Customs of War, Street Fighting, Behavior of Troops in the Presence of Mobs, etc.

No cadet is excused from recitations, lectures, drills, camp or other duty now prescribed or to be ordered as circumstances may render necessary, except as provided for in the cadet regulations.

All cadets who have *satisfactorily passed* the first year's course constitute the first class. All others constitute the second class.

CERTIFICATE OF PROFICIENCY.

To have passed through the entire course does not entitle a cadet to receive a certificate of proficiency in military science and tactics, but it is the rule now adopted in the department that the certificate will be issued to every cadet, State or volunteer, who takes the entire course and attains the second grade at least (70 per cent) in *every examination* during the two years.

APPOINTMENT OF STATE CADETS.

The following extracts from the Militia law of the State of Missouri, enacted by the 35th General Assembly, and now in force, will be of interest to those who desire to receive the appointment as cadet:

Section 5. The Military department of the University of the State of Missouri, as organized under section 1225, Revised Statutes of the United States, and section 7279, Revised Statutes of Missouri, 1879, is created the Missouri State military school.

Section 6. The corps of cadets at the Missouri State military school shall consist of one from each senatorial and representative district in this State, and shall be actual residents in the district from which appointed, and shall pass the required examination for admission to the University. Each senator and representative of the General Assembly of the State of Missouri shall appoint during the month of August in each year a cadet for such scholastic year.

Section 7. Cadets receiving instruction as provided in the preceding section shall be matriculated in all the academic departments of the University free from tuition fees, and subject only to the incidental fees and laboratory fees therein provided.

Section 8. The corps of cadets as provided in the preceding sections shall have the military organization prescribed for the National guard of the State and reckoned a part thereof, and as such entitled to all such provisions as are or may hereafter be made for the National guard of Missouri. The military government and discipline of the cadets shall be prescribed by regulations prepared by the Faculty of the University and approved by the Governor of the State.

A circular letter of instructions will be prepared and forwarded to Senators and Representatives prior to August 1, 1891, setting forth the conditions of entrance and inviting them to make appointments under this law. No cadet will be received who is under 16 or over 25 years of age, or who is less than five feet one inch in height, or who is in any way physically disqualified for military service. Although the law is silent on the subject, and each Senator and Representative must be his own judge in the matter, still it is desirable that appointments be made by competitive examinations, since the State, after making liberal provisions, is entitled to the very best material obtainable.

All male students of the University not physically disqualified, and who come within the limits of age and height, will be allowed to enroll themselves as volunteer cadets, but State cadets only will be matriculated in Academic departments of the University free of tuition and provided with uniforms without expense to themselves. A copy of the regulations for the government of cadets will be given to each cadet upon his entrance into the Missouri State Military School. These reg-

ulations require cadets to enter and report to the commandant for duty *before* September 25th of each year.

Cadet regulations prescribe that military drills, etc., shall be held at least three hours each week, one of which shall be for theoretical and two for practical instruction. The regulations also require an annual encampment of from eight to ten days, during which time the instruction is entirely military and practical. Here the cadets are put through all the duties of camp life. They conduct their own Quartermaster's and Commissary departments. They have target practice at 100, 200, 300 and 400 yards, and perform the duties of sentinels, patrols, etc., and are given all the drills and ceremonies prescribed in the two years' course. The expenses of the camp have heretofore been largely borne by the University, and it is hoped that in the future the University will bear them entirely,

B. B. BUCK,

Second Lieutenant, 16th Infantry,

Prof. Military Science and Tactics.

XXI. COMMERCIAL SCHOOL.

BOOK-KEEPING.

J. P. ROYALL, *Instructor.*

This department has been in successful operation during the past eleven years, in charge of J. P. Royall, a practical accountant and an experienced teacher of book-keeping.

The room is handsomely furnished with new, large and elegant double desks.

Students of the University are instructed during three-fifths of the semester without any charge. This course will cover fifty-four lessons, and embrace single-entry and double-entry book-keeping adapted to an ordinary wholesale and retail mercantile business, the opening and closing of books, partnership settlements and mercantile forms, including drafts, notes, accounts-current, etc. Those students who desire to pursue this branch further than is provided for without charge, and who stand well in their other studies, will be permitted to have this subject during the whole semester by paying a fee of ten dollars.

Those who choose to pursue the more elaborate course, or who may study it as a profession, besides being practiced in the before-mentioned work, will be instructed in the shorter methods, and the most modern and approved forms of books in their adaptation to the various kinds of business.

The student does not copy his work from a text-book, nor is he required to study an elaborate treatise on the subject. The teacher has prepared for the student a small manual containing the fundamental rules, definitions and principles, and memoranda embracing a concise history of a series of business transactions, such as occur in a mercantile house, simple at first and gradually becoming more intricate, so that the student is placed in *the actual work of keeping books*; and, after a few weeks of class work, each is required to keep books as if he were alone and the only one doing the work, so that his time is employed in learning *the art of keeping books* rather than in studying the science of book-keeping.

The student is not simply *carried through* a prescribed course, nor is he assisted in work that he can accomplish without aid; but he is exercised in the art of keeping books. Thus his efforts are not superseded by the work of the teacher, but he is encouraged and stimulated to habits of self-reliance, and, when these are attained, he readily becomes a competent book-keeper. The actual work of the counting-house is thus introduced into the school-room.

An opportunity is here offered the students, both ladies and gentlemen, while pursuing their other studies, to acquire, incidentally as it were, a thorough knowledge of this important branch of a practical business education. By diligence the average student may accomplish this work in one semester.

SPECIAL STUDENTS.

Persons who desire to do so may enter as *special students* in this department without joining other classes in the University, and, by devoting their whole attention to the subject, may acquire in a very short time a thorough knowledge of book-keeping.

EXPENSES.

(Tuition payable in advance.)

For students of the University, two-fifths of the semester.....\$10 00
For persons not connected with the University, one semester or full course 30 00

All students must provide themselves with books of instruction, blank books, stationery, etc., which will cost about two dollars.

Stenography, Typewriting and Telegraphy are taught by competent instructors, at reasonable rates.

Report.—The following is the report for the department of book-keeping for the year ending June 4, 1891:

Students were enrolled as follows:

First semester.....	54
Second semester	71
Total	125

The following list comprises the names of students who, having completed the prescribed course, and having attained a grade of 90 per cent, have been awarded certificates as competent book-keepers:

Boyer, John S.	Gilhousen, J. P.
Conran, Jas. F.	Roberts, Miss Susan D.
Edwards, George D.	Wylie, C. M.

The following is a list of students now (April 15) pursuing the more extended course, and whose progress justifies the expectation that they will receive certificates at the close of the current year:

Name.	Name.	Name.
Bosier, W. H.....	Holman, J. H.....	McClement, Miss Belle.....
Boisseau, O. G.	Immer, G. C.	McCurdy, Geo. V.....
Burk, Miss B. B.....	Immer, G. H.	Poague, H. F.....
Childs, R. B.....	Jones, E. R.....	Robinson, O. E.....
Conner, J. E.....	Letton, C. H.....	Trumbo, C. E.....
Cox, S. S.....	Loeb, Clarence	Wilkinson, A.....
Davis, Geo. T.....	McBurney, G.....	Wright, Miss Alice.....
Haines, C. G.....		

Those who pursue the partial course during three-fifths of the semester, and who accomplish a reasonable amount of work for this limited time, are given a passing grade.

J. P. ROYALL, Principal.

UNIVERSITY LIBRARY.

The following is submitted as the Fifteenth Annual report of the University Library:

	Books.	Pamphlets.
General Library.....	17,171	17,203
Accessions for 1890-91.....	370	97
Law Library.....	2,088	
Accessions for 1890-91.....	58	
Columbia Library.....	809	
Athenæan Society Library.....	538	
Union Literary Society Library....	464	
Total.....	21,498	17,300

Classification of bound volumes received during 1890-91.

Government Publications.....	133
Statutes and Reports.....	58
Histories.....	33
Biographies.....	28
Science.....	25
Language.....	33
Fiction.....	25
Miscellaneous.....	106
Total.....	428

The library room covers the entire second floor of the east wing, the inside dimensions being 106x71 feet and height of story 24 feet. The room is accessible by two stairways leading directly from the chapel, which is immediately below, and it also has a side entrance from the corridors which connect with the main entrances of the building. The room is by side-lights and sky-lights well lighted, and by flues in the walls well ventilated. It is heated by steam, and in every way admirably suited to the purpose. Books are very heavy, and some idea can be formed of the strength of the floor from the fact that it rests on Howe trusses five feet in depth with a span between iron columns of only 42 feet and resting on outside walls 3 feet in thickness. This magnificent room has no columns in it, the roof being self-supported. Its capacity and capability as a library and study hall are exceptionally good.

The walls of the library hall are rapidly becoming covered with portraits, landscape scenes, resolutions, etc. Some of the pictures are as large as life, presenting a very striking appearance. Among them we notice the founder and presidents of the University. This year a life-size portrait of Governor Francis has been added, in commemoration of his arduous toil for an endowment fund.

The books belonging to the societies are kept in their halls, and those of special departments in the professors' rooms controlling those departments. The law library is an institution in itself, independent and effective for good. Its librarian

is Prof. Yantis. Law students are permitted the use of books in the law library room, which is adjacent to the law lecture-room.

Members of the faculty are permitted to take books from the library hall, each member being entitled to six books for one week.

Any student who deposits the value of the book is permitted to take one out of the Columbia library, to be held one week; or, if needed to promote studies, on the same terms, out of general library over night.

The reading room is open during the school year, excepting Sundays and legal holidays—in winter from 7:45 a. m. to 5 p. m., and in summer until 6 p. m.

Students are expected to be in the library at work if not at recitation, or at their residences, during the school hours.

The librarian and his assistant make a study of the contents of the library, so as to render valuable assistance in selecting matter for the use of the students. To facilitate this, students have access to the library catalogue, which presents a thorough classification of all books.

J. W. MONSER, Librarian.

PERIODICALS PURCHASED FOR CURRENT YEAR.

Academy.....	Globe-Democrat
Academy (London).....	Harper's Monthly.....
Agricultural Science Monthly.....	Harper's Weekly.....
Albany Law Journal	Hebraica.....
American Naturalist	Independent (New York).....
American Notes and Queries.....	Journal of Education
American Journal of Psychology.....	Journal of Hellenic Studies
American Journal of Philology.....	Journal of Royal Microscopical Society
American Microscopical Journal.....	Journal of Society of Natural History
American Law Review.....	Journal of Chemical Society (London).....
American Geologist.....	Kansas City Journal.....
American Garden	Kansas City Times
American Journal of Science.....	Ladies' Home Journal.....
American Antiquarian.....	Leslie's Illustrated Weekly.....
Andover Review.....	London Quarterly.....
Annals of Mathematics.....	Magazine of American History.....
Arena.....	Medical Journal (New York).....
Atlantic Monthly.....	Modern Language Notes.....
Bacteriological World.....	Nation.....
Century Magazine	New York World.....
Chautauquan.....	Nineteenth Century
Chemical News.....	North American Review
Christian Union.....	Poet Lore.....
Classical Review.....	Popular Science Monthly.....
Courier-Journal.....	Political Science Quarterly.....
Critic.....	Public Opinion.....
Eclectic Magazine.....	Quarterly Review.....
Edinburg Review.....	Sanitarian.....
Education.....	Scientific American and Supplement
Educational Review.....	Scribner's Magazine.....
Electrician and Electrical Engineer	Shakspeariana.....
Electrical World.....	Sunday School Times.....
Engineering and Mining Journal.....	Truebner's Oriental Record.....
Engineering News.....	United Service.....
Forum.....	University Magazine.....
Gardener's Chronicle.....	Youth's Companion.....

PERIODICALS PRESENTED TO THE LIBRARY.

American Digest.....	Missouri Statesman
Apostolic Guide.....	Missouri Deaf-Mute Record.....
Central Baptist.....	Musical Record.....
Christian Cynosure.....	Nebraska Farmer.....
Colman's Rural World.....	Post-Dispatch.....
Columbia Herald	Saline County Progress
Hannibal Journal	Saline County Democrat
Industrialist.....	St. Louis Evangelist
Jefferson City Tribune.....	San Jose Daily (Cal.).....
Kansas City Presse.....	Traveler's Record.....
Manifesto.....	Voice.....
Mexico Intelligencer.....	Weekly Democrat-News.....
Mid-Continent.....	Western Agriculturist.....
Mining Journal.....	Westliche Post.....

DIRECTIONS FOR NEW STUDENTS.

1. If assistance is desired in obtaining board, report to the Proctor at the University buildings.

2. New students will first present themselves for examination for admission to the University. This should be done *before paying tuition fees*. Examinations for admission will be given by the English and Mathematical and Agricultural departments on Thursday, Friday, Saturday and Monday, September 3d, 4th, 5th, and 7th, preceding the opening of the University.

3. After passing entrance examinations, before entering the University, \$15.00 must be paid to the Treasurer, and his receipt obtained. The law student pays \$50.00 the first year; \$40.00 the second year; the medical student \$20.00 for first year, and for second and third years \$40.00 and \$10.00 for the Demonstrator's ticket.

4. The Treasurer's receipt should be at once presented to the Proctor at the University, when the name of the student will be entered upon the University roll.

5. The professional student must present the card received from the Proctor to the Secretary of the Faculty, who will enroll his name and issue to him his matriculation ticket, with the instructions necessary for enabling him to have his name entered on class roll.

6. The Academic student must present the Proctor's card to the Secretary of the Faculty, who must issue a matriculation ticket, admitting new students to the University, and former students to the Advanced classes for which, according to the Faculty record book, they have been examined. Students cannot enter classes without having borne an examination therefor.

Students in the College of Agriculture and Mechanic Arts must present the Proctor's card to the Dean of the Faculty in Agricultural hall, who will enroll his name, and issue to him his Matriculation ticket, with the necessary instructions to enable him to have his name entered on the class rolls.

STUDIES AND CHAPEL.

1. Academic students are expected to have four hours daily with the Faculty at lectures or recitations. Class-cards, when once filed with the Secretary, can be changed only by Faculty action.

2. Prompt attendance and orderly conduct at the daily devotional exercises in the University chapel are required of every student in the University.

3. Absences from chapel, as from town, are permitted or excused by the President.

CLASS-GRADING AND ABSENCES.

1. Academic Class-grading is recorded by the Professors on such a scale that 96 to 100 entitles to "first rank with distinction," 90 to 96 to "first rank," 70 to 90 to "second rank," 60 to "passed," and under 60, "not passed." The numerical standing is not communicated to students.

2. All academic class-absences are recorded. Excuses are to be rendered to the Professor.

EXAMINATIONS AND CLASS HONORS.

1. Examinations at the end of each semester close the studies pursued to that point. Re-examinations for substitution of grades are not allowed after the lapse of one scholastic year.

2. Only those Seniors who shall have attained "first rank with distinction," shall be eligible to the honor of valedictorian at Commencement. The candidate or candidates are determined by the Secretary of the Faculty on the first week in May of each year.

3. All special examinations are in the discretion of the heads of the departments.

DEGREES.

The following degrees are now conferred by the University:

In the Academic college, A. B. (Bachelor of Arts), L. B. (Bachelor of Letters), and S. B. (Bachelor of Science).

In the Law college, LL. B. (Bachelor of Laws), and LL. M. (Master of Laws).

In the Engineering college, C. E. (Civil Engineer), Top'l. Eng'r. (Topographical Engineer), E. E. (Electrical Engineer), and M. E. (Mining Engineer).

In the Agricultural college, B. Agr. (Bachelor of Agriculture), M. Agr. (Master of Agriculture).

In the Normal college, Pe. B. (Bachelor of Pedagogics).

In the Medical college, M. D. (Doctor of Medicine).

A certificate in surveying is granted by the Engineering department, one in Pedagogics by the Normal department, and one in Book-keeping by the Commercial department, and one in the two-year course in College of Agriculture.

In addition to the above, the usual master's degrees A. M. (Master of Arts), L. M. (Master of Letters), and S. M. (Master of Science), and the usual honorary degrees A. M. and LL. D. are conferred. In a few cases, where the Faculty had evidence of meritorious work done, Ph. D. has been granted.

DISCIPLINE.

The Faculty requires every student to pay strict attention to the duties assumed by him, and to be honorable and creditable in deportment to Faculty, fellow-students and citizens. This is the only rule of behavior, the highest penalty for violation of which is expulsion.

FEES AND EXPENSES.

Annual entrance fee \$10; Library and incidental fee, per semester, \$5: that is, the student who enters the first semester pays \$15, and for the second semester only \$5, having paid his entrance fees for the year, upon admission. If he enters the second semester he pays \$15: *i. e.*, entrance and semester fees. These charges are so low as properly to be considered merely nominal.

Medical and engineering students are charged \$40 for the year, to be paid upon entrance. This includes the incidental fee. Demonstrator's ticket \$10, payable by the medical student upon matriculation. Law students pay \$50 first year; \$40 second year. Students in the College of Agriculture pay a single fee of \$10 in full for all entrance fees, library charges and incidental expenses. There are no charges for tuition in this College.

The fee for diplomas is \$5. This must be paid to the Treasurer of the University, and his receipt handed to the Secretary of the Faculty before the name is recommended to the Curators for the degree.

BOARDING.

Board in private families, with lodging, washing and fuel, may be obtained for \$3 to \$4.50 a week. Those who enter the club may reduce this amount to \$1.75.

THE NEW CLUB-HOUSE.

The new club-house affords accommodations for ninety students. The room rent for each student is \$10, payable in advance, on or before the first day of September. The cost of board and washing to those who enter the club is about \$1.75 per week. The rooms are furnished with bedstead, stove, table and two chairs. Occupants are expected to furnish whatever else they deem necessary.

The members of the club have their own organization—president, commissary, secretary, censors, etc. They assess themselves, collect the same, and buy their own provisions.

THE JAMES S. ROLLINS UNIVERSITY SCHOLARSHIP.

The Hon. James S. Rollins leaves six thousand dollars (\$6,000) to endow six scholarships in the University—"the interest" on this \$6,000 "to be forever used and appropriated under the authority and by the direction of the Board of Curators of the University of the State of Missouri for the folloing purposes, that is:

"To found scholarships to be awarded by the President and Faculty of the University—the vote in each case to be by ballot—as a reward for excellence and promise in—

"*First*—The College of Arts, for the degree of A. B., fifty dollars.

"*Second*—The College of Arts, for the degree of B. S., fifty dollars.

"*Third*—The College of Agriculture and Mechanic Arts, degree of B. Ag., fifty dollars.

"*Fourth*—The College of Law, for the degree of LL. B., fifty dollars.

"*Fifth*—The College of Medicine, for the degree of M. D., fifty dollars.

"*Sixth*—The College of Engineering, for the degree of C. E., fifty dollars.

"These scholarships are intended as a recognition of merit and character in the beneficiaries, and shall be payable on the first day of June of each year to that member of the *Junior class*, in each of the colleges designated, who shall be adjudged entitled to it by the President and Faculty; and the names of the persons receiving said scholarships shall be publicly announced on Commencement day by the President of the University.

"In according these scholarships, it is earnestly impressed upon the President and Faculty of the University, that in the mind of the donor, purely intellectual and literary ability are not alone to be considered, but that the moral character of the contestants should be regarded as a factor of no small weight in coming to a decision.

"With the earnest hope that by the means here provided, worthy young men and women may in all coming time be helped and encouraged in their struggle toward a higher life and greater usefulness, this fund is committed to the honor and good faith of the State, whom the Board represents, and by whose authority the donation is made and accepted.

"I am very respectfully,

"JAMES S. ROLLINS."

(Signed)

ROLLINS AID FUND.

Extract from the will of Anthony W. Rollins, M. D., dated 1843, and probated December 10, 1845.
Prob. Record, Book B, pp. 743-4.]

Item 7. Having felt the great disadvantage of poverty in the acquisition of my own education, it is my will that my executors, hereinafter named, shall, as early after my death as they may deem most expedient, raise the sum of ten thousand dollars by the sale of any lands of which I may

die seized, and which I have not specifically bequeathed in any of the foregoing items, which sum of ten thousand dollars I desire may be set apart for the education of such poor and indigent youths of Boone county, both male and female, as are unable to educate themselves.

Item 8 When my executors shall have raised the sum of ten thousand dollars in the manner specified above, it is my will that they pay over the same to Alexander Persinger, Gilpin S. Tuttle and James W. Dailey, justices of the county court of Boone county, or their successors in office, who may compose the county court of Boone at the time, and that said fund shall remain with and be vested in said court as a permanent fund, for the promotion of the object specified in the seventh item of this will above.

Item 9. It is my will that the judges of the county court shall loan out the fund thus vested in them, at an annual interest of ten per centum per annum, and in every instance upon good personal security, with mortgage upon real estate at least in value to the sum loaned, and in such manner as will insure the payment of the interest thereon at the expiration of each year; it is my will, further, that three-fourths of the interest thus annually accruing shall be set apart, or so much thereof as may be necessary, to pay tuition of such youths as may have entered the Columbia Female Academy or the State University, under the provisions hereinafter named; and the one-fourth of the interest thus annually accruing, and so much of the remainder as shall not have been appropriated for any one year as above, shall be annually added to and become a part of the permanent fund.

Item 10. It is my will that the President of the State University of Missonri, and the Principal of the Columbia Female Academy, shall in each year visit the common schools of the different neighborhoods of Boone county, and select from among the indigent boys and girls of the different schools or neighborhoods such of them as are inclined to avail themselves of the advantages of the fund set apart as above, always having reference in their selection to the moral and intellectual qualities of the youths above; and further, that the President, at each annual Commencement of the University, shall direct the public attention to this subject, invite the citizens who may be present to subscribe by way of enlarging the fund from year to year, thus appropriated to the education of the poor; and, further, that in selecting boys as above, preference may be given to such as evince an inclination to preach the gospel.

NOTE THAT—

This fund is held by the county court of Boone county and invested in Boone county 8 per cent bonds. About sixteen hundred dollars a year are available for aiding students.

As the Columbia Female Academy is defunct, it is the duty of the President of the University "to select" the beneficiaries as students of the University. (Item 10.) This choice is regulated by several circumstances, as that—

1. The beneficiaries must belong to Boone county, in good faith and not merely nominally. (Items 7 and 10.)

2. They may be "both male and female," but must be needy: *i. e.*, "unable to educate themselves." (Item 7.)

3. Regard must be had to "moral and intellectual qualities." (Item 10.) Hence, (a) preference will be given to such as show superior capacity, whether in the University classes or in the schools; and, perhaps, a system of examinations might aid in the wise and impartial determination of the choice. Hence, also, (b) aid from this fund will, in all cases, be withdrawn from students who incur College discipline, or who fail to maintain a reputation for exemplary conduct and scholarship. The incurring of marks of demerit may be considered such discipline, and falling below the required standard of scholarship, in any study, such failure. Disorderliness is aggravated by being a beneficiary, and any part of an apportionment not paid may, on that account, be recalled at any time.

4. Other things being equal, "in selecting boys as above, preference may be given to such as evince an inclination to preach the gospel." (Item 10.)

5. Whilst aid is not limited to tuition (Item 7), it is plainly first in the contemplation of the benefactor. (Item 9.) This fund, therefore, has in it the virtue of

strengthening the University, whilst it provides for the specific and legitimate exercise of its educational functions, in the interest of the needy, in its own immediate locality.

The will does not provide at whose direction, nor in what sums, the money is to be apportioned, and this, therefore, is left to the good understanding of the county court and the President of the University. In order to aid as large a number as possible, it is ordered by the court that not more than the sum of \$60 per annum shall be appropriated to any one pupil; and in some cases it is found that only part of the tuition and contingent fees is needed, so that the aid which has been extended to over forty during the past year has ranged from \$10 to \$60—those receiving the largest sums being exceptional.

6. If the applicants are "youths" of Boone county, unable to educate themselves, and of good moral and intellectual qualities, whilst a preference is allowed to those having the ministry in view (Item 10), yet there appears to be nothing which excludes such as may have in contemplation any of the professional courses of the University. As the donor, for example, had struggled to obtain his professional education, it would be unnatural to suppose that, by any implication, the "indigent" and worthy professional student would be excluded.

The provision that one-fourth of the interest must annually be added to the principal of this fund may ultimately become a question of great magnitude, which will require judicial determination.

Applications for aid from the Rollins fund must hereafter be in writing; a blank form will be furnished, embracing the points presented above, and when filled, it will be considered and placed on file, for open inspection and preservation. Should any mistake or misrepresentation of consequence be brought to light at any time, proper steps will be promptly taken. The applicants must appear in person at the opening of the first semester, September 9, as no reservation will be made.

It is very desirable that those who receive aid from this fund, according to the provisions of the will, should not feel themselves humiliated nor compromised in any respect. The money belongs to the worthy beneficiaries, and they are morally and legally entitled to it, just as if so much of the estate out of which it has arisen had been set apart and left to them by name in the will. It is the desire that none except those entitled to it shall, by mistake or otherwise, appropriate any of it; and also that the lawful beneficiaries shall themselves receive, severally, only their just apportionments.

Dr. Anthony W. Rollins, who founded this aid fund, was the father of the Hon. James S. Rollins, who was for a number of years President of the Board of Curators, and who, when a young man (1839), actively participated in the efforts which secured the location of the Missouri University to Boone county.

RESIDENT GRADUATES.

It is hereby resolved by the Board of Curators, That hereafter all regular graduates in any department of the University, and every regular graduate of the Normal Schools established by law within this State, also all regular graduates of "Christian Female College" and "Stephens Female College," located in Columbia, and the graduates of all other regularly chartered literary and scientific colleges in this State, with regular college classes established therein, and that are authorized by law to confer degrees and to grant diplomas to their students, shall be entitled to enter all the departments of the State University, including the Mining Department at Rolla, as Post-Graduates, free of the payment of tuition fees, and to receive instruction in the same manner as other students in the Practical, Literary and Scientific departments or classes (and all students taught in the University), and which they may choose to enter: Provided, however, that neither Law nor Medical

students are included in this resolution; and also, that they may have full access to the Library of the University, with all other students, on such terms and under such rules as may be prescribed by the Executive committee. (The Engineering school is also excepted.)

By an act of the Board of Curators, June, 1874, it is provided:

1. That the graduates of certain institutions, named and designated in said act, shall be admitted to all departments of the University, except those of Medicine, Law and Engineering, "to receive instruction in the same manner as other students," without the payment of tuition fees, but on payment of \$5.00 per semester incidental fees.

2. That said resident graduates shall have the privileges of the Library, on such terms and under such rules as the Executive committee may determine.

4. That preliminary to admission, each entrant shall exhibit his or her diploma in evidence of such graduation, to the President of the University, or at Rolla, to the Director. (This third point is made in the volume of Laws, published by order of the Board); therefore,

Resolved—First, that this memorandum of the aforesaid state of fact be spread on the minutes of the Faculty for convenience or reference; and

Second, That it is the understanding of the Faculty, that whilst resident graduates thus admitted are to be allowed optional attendance on the classes, without being required to recite, unless it be as a condition of acquiring a class standing, yet otherwise they are to be subject to all the rules of behavior and discipline of under-graduates.

MINISTERS AND STUDENTS PREPARING FOR THE MINISTRY.

Resolved by the Board of Curators of the University of the State of Missouri, That hereafter all regularly ordained ministers of the Gospel belonging to any of the various religious denominations of this State in good standing, and who may desire to improve their scholarship and moral and intellectual culture, shall be allowed to attend any of the schools of the University without the payment of tuition fees, except the schools of Law, Medicine and Civil Engineering—the same privilege to be extended to any young man in this State preparing for the ministry, who will submit testimonials that shall be satisfactory to the President and Faculty of the University, that he is in good faith a candidate for the ministry, and that he is unable to meet the expenses of education at the University without aid.

Adopted June 2, 1880.

LITERARY SOCIETIES.

There are three literary societies of young men and one of young women connected with the University, viz.: 'The "Athenæan," the "Union Literary," the "Bliss Lyceum" and the "Philaethean." These societies have spacious and well-furnished halls in the University edifice, and hold weekly meetings for improvement in debate, declamations, oratory and composition.

These societies are in a flourishing condition, and form a most important means of culture, especially in speaking and writing.

An address is delivered before them, united, during Commencement week, and diplomas are given to such members as belong to the graduating class.

YOUNG MEN'S CHRISTIAN ASSOCIATION.

The object of the Young Men's Christian Association of the University of Missouri is to do good to the University, to the town of Columbia, to the State of Missouri, but directly to do good to the young men of the University. The good that is being done can only be known by those who have come in contact with the work.

The Association was organized Jan. 18, 1890, with 65 members; it now has a membership of 160. Devotional meetings are held in the Y. M. C. A. hall every

Sunday afternoon ; the average attendance at these meetings during the past year has been 94.

Organized classes for the study of the Bible hold weekly meetings. Special religious services are held from time to time.

Our room has already grown too small ; it is, though nicely furnished, in an out-of-the-way place on the fourth floor.

A movement is now on foot in which every patriotic Missourian, every one who is interested in the M. S. U., or in Christian work, will take an interest.

That the Christian work in this University may be better done, the Y. M. C. A. and the Y. W. C. A. mean to erect a building costing at least \$50,000.

The building will contain a gymnasium sufficiently large to accommodate the large number of students who will soon come here, bath-rooms, reading-rooms, lecture-room, Bible class-rooms, rooms for the different University classes, alumni-room, and rooms of meeting for the Y. M. C. A. and the Y. W. C. A.

The Christian Associations of the University add their testimony to that given by the following facts, that the University of Missouri, though it be a State institution, is not a sink-hole of infidelity. Of our Faculty, 28 out of 31 are church members ; of the students, 217 out of 440 are church members.

To all young women and young men who are seeking the broadest culture, the highest learning, with minimum expenses, we extend a cordial invitation to come here.

At the beginning of the next school year, a committee from the Y. M. C. A. will meet the students at the trains and lend them all the assistance that is possible, such as seeking boarding places, finding members of the Faculty or friends, arranging class cards, etc., etc.

A letter from you to the Y. M. C. A. President, a few days before you leave home, concerning boarding place, etc., will allow valuable aid to be given you.

Watch for the men with Y. M. C. A. badges ; they will be your friends ; it will give them pleasure to be of assistance to you.

YOUNG WOMEN'S CHRISTIAN ASSOCIATION.

This association was organized April 2, 1891, with a membership of 32, which has now increased to nearly 50, and promises to become an instrument of great good. The object of this association shall be the development of Christian character in its members, and the prosecution of active Christian work, particularly among the young women of this institution. It meets every Sunday afternoon at 4 o'clock.

PRIZES.

IN ORATORY—Founded by Hon. James L. Stephens, a retired merchant of Columbia, and annually awarded for the best oration of Senior class.

A book in defense of the Christian religion, and a gold medal, for the purchase of which the annual interest on \$500 is available.

JUNIOR MEDAL—This prize, offered by the literary societies for the best oration, is open to all students of the University below the Senior Year.

IN DECLAMATION—The literary societies, to best speakers in declamation contest. For Rollins Scholarship see page 159.

ASTRONOMICAL MEDAL—For best thesis by a Senior on some astronomical subject.

IN PHYSICS—\$10 in money, by Charles Dachsels, engineer, Jefferson City, Mo., for best thesis on steam engine.

MCANALLY MEDAL—For best English essay.

Subject for "English Medal," 1891-92, "Gladstone—Statesman and Man of Letters."

For the Appleton prize for competition in the Sophomore and Junior classes and the medal for the Senior class, see Latin department.

The heads of the several departments dispense prizes and distinctions in their discretion.

ALUMNI.

The Alumni Association is composed of Graduates of the University. It holds an annual meeting on Wednesday and Thursday of Commencement week, and is addressed in the University chapel by an orator previously selected from its own body.

The objects of this society are the promotion of education, especially in the halls of the Alma Mater, the reunion of early friends and co-laborers in literary pursuits, and the revival of those pleasing associations which entwine themselves about academic life.

The fee for membership is \$2. This is added to the permanent fund, the interest of which, only, is used. It is hoped that all graduates of the University, whether academic or professional, will become members of the Association. The Librarian solicits aid in securing facts for the next triennial, and will be thankful for published notices of, or books, or pamphlets and articles, published by, officers and graduates.

Gardiner Lathrop, Kansas City, President; D. W. B. Kurtz, Columbia, First Vice-President; H. W. Loeb, St. Louis, Second Vice-President; C. B. Sebastian, Columbia, Secretary; N. T. Gentry, Columbia, Treasurer; Orator '91, James Black, class '81, Kansas City; Orator '92, Warren Switzler, class '77, Omaha, Nebraska.

A subscription to the amount of \$3,000 has now been raised and put at interest. The attention of the Alumni is called to this fact. The time has come for effective work. Nothing can be done without an efficient organization. Come and let us organize. Our Alma Mater needs our co-operation. She sees that her greatest strength in the future must come from those who know best of her true aims, real wants, and who feel the most pride in her prosperity. In union there is strength.

Alumni reunion, June 1 and 2, '92. Come.

HONORABLE MENTION—1889-90.

All students who have finished the work of any department, and who have reached in it an average grade of 96 to 100, shall be named by the Professor in charge of such department in his annual report to the President of the University for **HONORABLE MENTION** in the catalogue; this fact of honorable mention shall likewise be stated on the Commencement programme in the case of graduates —[*From rules for grading students, adopted April, 1884.*]

DEPARTMENT OF ENGLISH.

WM. VAN ALLEN CATRON,
JAMES HENRY COONS.

DEPARTMENT OF LATIN.

WM. VAN ALLEN CATRON,
JAMES HENRY COONS.

DEPARTMENT OF GREEK.

WM. VAN ALLEN CATRON,
JAMES HENRY COONS.

DEPARTMENT OF HEBREW.

CLEON MELVILLE HIBBARD.

DEPARTMENT OF SANSKRIT.

GAY HANCOCK.

DEPARTMENT OF METAPHYSICS.

WM. VAN ALLEN CATRON,
NANNIE STERNE COLEMAN,
FRANK CONLEY,
JAMES HENRY COONS,
CLEON MELVILLE HIBBARD,
EDWIN MOSS WATSON,
CHARLES PAGE WILLIAMS.

DEPARTMENT OF MATHEMATICS AND ASTRONOMY.

CLEON MELVILLE HIBBARD,
CHARLES PAGE WILLIAMS.

DEPARTMENT OF PHYSICS.

CHARLES PAGE WILLIAMS.

DEPARTMENT OF CHEMISTRY.

CLEON MELVILLE HIBBARD,
CHARLES ALBERT SWIFT,
CHARLES PAGE WILLIAMS.

DEPARTMENT OF GEOLOGY AND MINERALOGY.

WM. RUFUS DODSON,
CLEON MELVILLE HIBBARD,
CHARLES ALBERT SWIFT,
CHARLES PAGE WILLIAMS.

DEPARTMENT OF BIOLOGY.

WM. RUFUS DODSON.

The James S. Rollins University Scholarship,

These scholarships have been awarded as follows :

College of Arts, A. B. Course.....	Frank Pierce Divelbiss
College of Arts, S. B. Course.....	John Fellows
College of Agriculture.....	Forrest Davis
College of Law	George L. Edwards
College of Medicine.....	Calvin Franklin Forbis
College of Engineering, C. E. Course.....	Lewis Burton McKean

CALENDAR.

1891.

September 8, Tuesday	All Academic and Professional Schools (except Law School) open.....
October 6, Tuesday ..	Law School opens.....
October 31, Saturday.....	Union Literary Society open session.....
November 14, Saturday.....	Athenæan Society open session.....
December 12, Saturday.....	Open session of Bliss Lyceum.....
December 23, Wednesday	Close for holidays.....

1892.

January 5, Tuesday	Reopen.....
January 18 to January 23	Examinations at close of first Semester.....
January 25, Monday	Second Semester begins
January 30, Saturday.....	Junior Medal contest
February 13, Saturday.....	Exhibition of Young Ladies' Society
February 20, Saturday	Societies appoint prize declaimers
March 19, Saturday.....	Inter-Society contest
April 9, Saturday.....	Prize Declamation contest
April 16, Saturday.....	Contest for Stephens Medal.....
April 23, Saturday.....	Exhibition of Union Literary Society.....
May 7, Saturday.....	Exhibition of Athenæan Society
May 23 to June 2.....	Final Examinations.....
May 29, Sunday	Baccalaureate Discourse.....
May 30, Monday.....	Law Commencement
May 31, Tuesday	Curators meet
May 31, Tuesday	Addresses before Societies
June 1, Wednesday.....	Oration before Alumni
June 2, Thursday.....	Commencement
June 9, Thursday.....	Commencement School of Mines at Rolla.....

TABLE OF CONTENTS.

	Page		Page
Announcements for 1890 and 1891.....	6	Professional Schools:	
Report of the Board of Curators to the		Normal School.....	92-98
Governor.....	7-16	Law School.....	94-99
Corporation.....	17	Medical School.....	99-103
University Faculty.....	18-20	School of Mines and Metallurgy.	105-141
Students.....	21-28	Engineering.....	142-150
At School of Mines and Metallurgy....	29-30	Missouri State Military School.....	150-153
Summaries and comparative views....	30-32	Commercial School.....	153-154
Attending each school.....	30	University Library.....	155-156
Attendance and graduates, 1843-90 ..	31	Directions for new students.....	157
Graduates of Professional Schools...	32	Studies and Chapel.....	157
Schools of the University.....	33	Class grading and absences.....	157
Academic Schools.....	33-67	Examinations and class honors.....	158
English.....	34-35	Degrees.....	158
Latin.....	35-37	Discipline.....	158
Greek.....	38-39	Fees and expenses.....	158
Modern Languages.....	40-41	Boarding.....	159
Semitic Languages.....	42	The new Club-house.....	159
Sanskrit.....	42	“The James S. Rollins University..	
Comparative Philology.....	43	Scholarships”.....	159
Metaphysics.....	43	Rollins Aid fund.....	159-161
Mathematics and Astronomy.....	44-47	Resident Graduates.....	161-162
Physics.....	47-49	Ministers and Students preparing for the	
Chemistry.....	50-52	ministry.....	162
Geology and Mineralogy.....	52-58	Literary Societies.....	162
Biology.....	58-62	Young Men's Christian Association	162-163
Ladies' Department.....	62-63	Young Women's Christian Association..	163
Scheme of Academic Studies.....	63-66	Prizes.....	163-164
Approved Schools.....	67	Alumni.....	164
Professional Schools.....	69-154	Honorable mention.....	165
Agricultural College.....	71-91	Calendar.....	166

CATALOGUE

OF THE

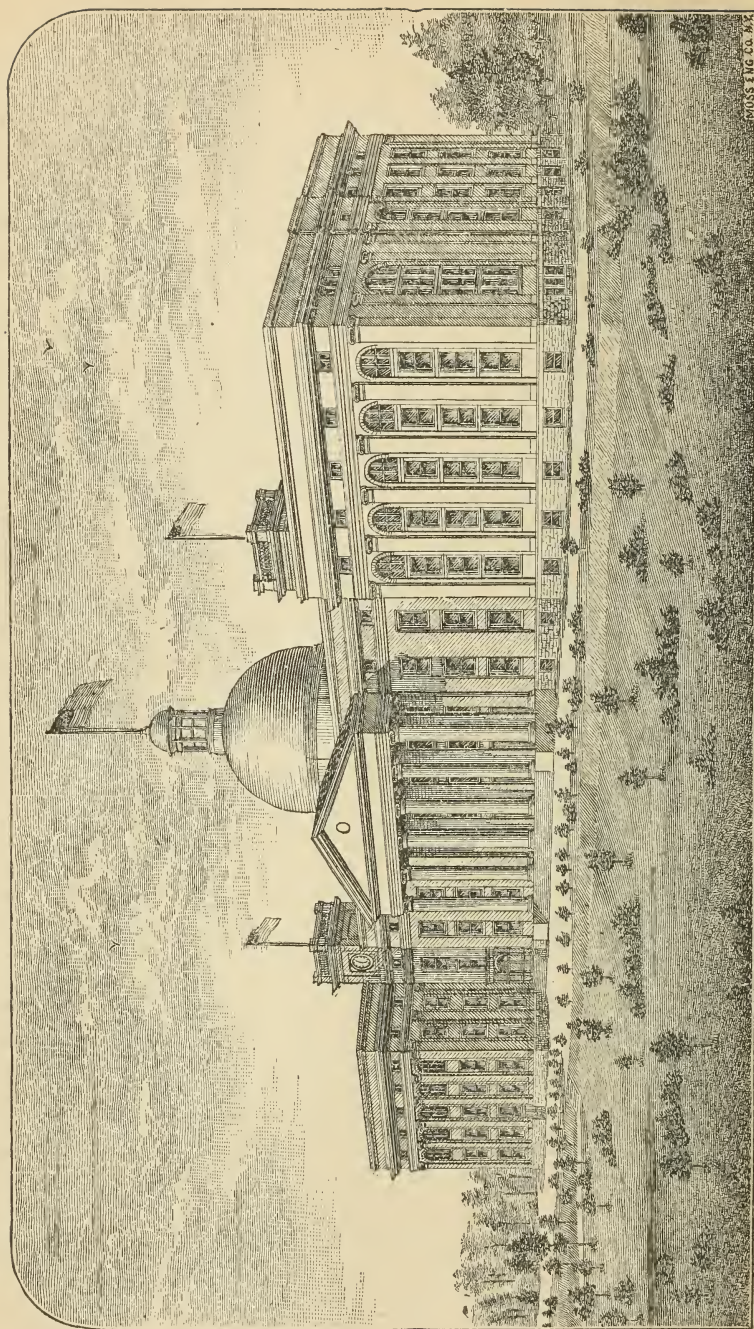
UNIVERSITY OF THE STATE OF MISSOURI

FIFTIETH REPORT OF THE CURATORS

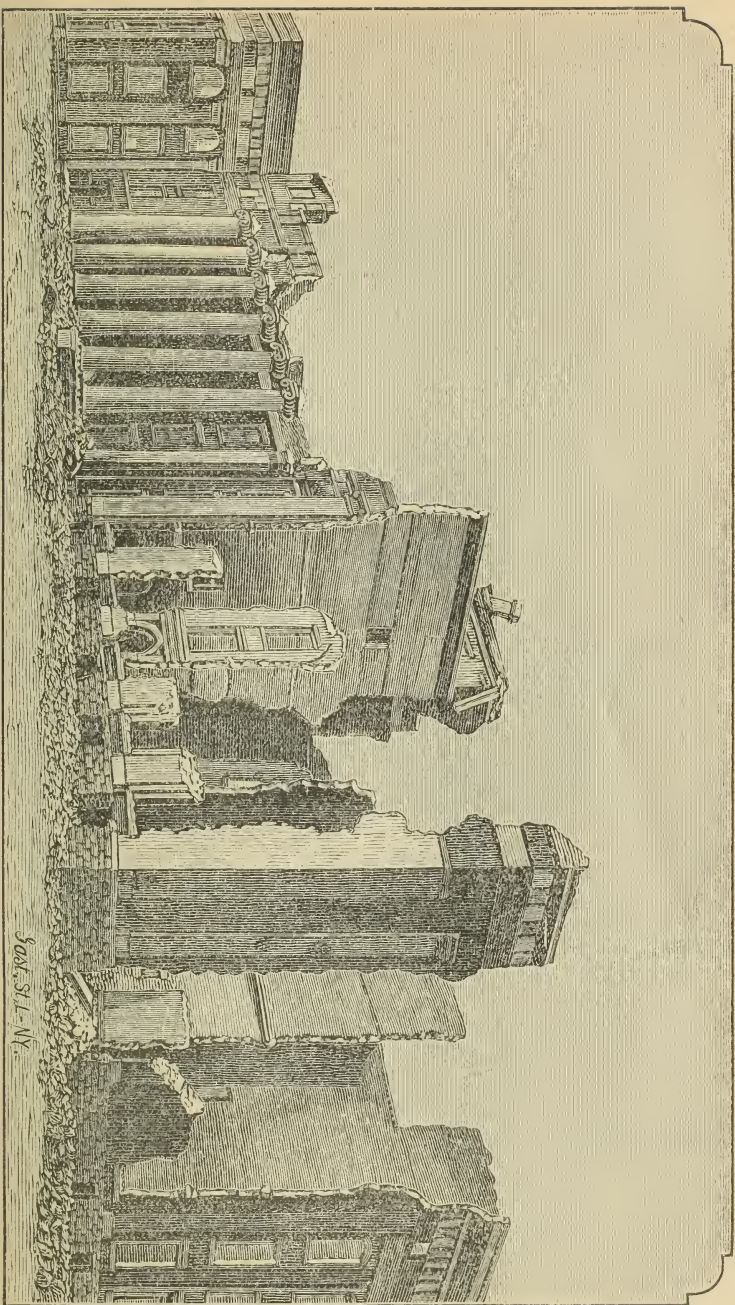
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GOVERNOR OF THE STATE.

1891-1892.

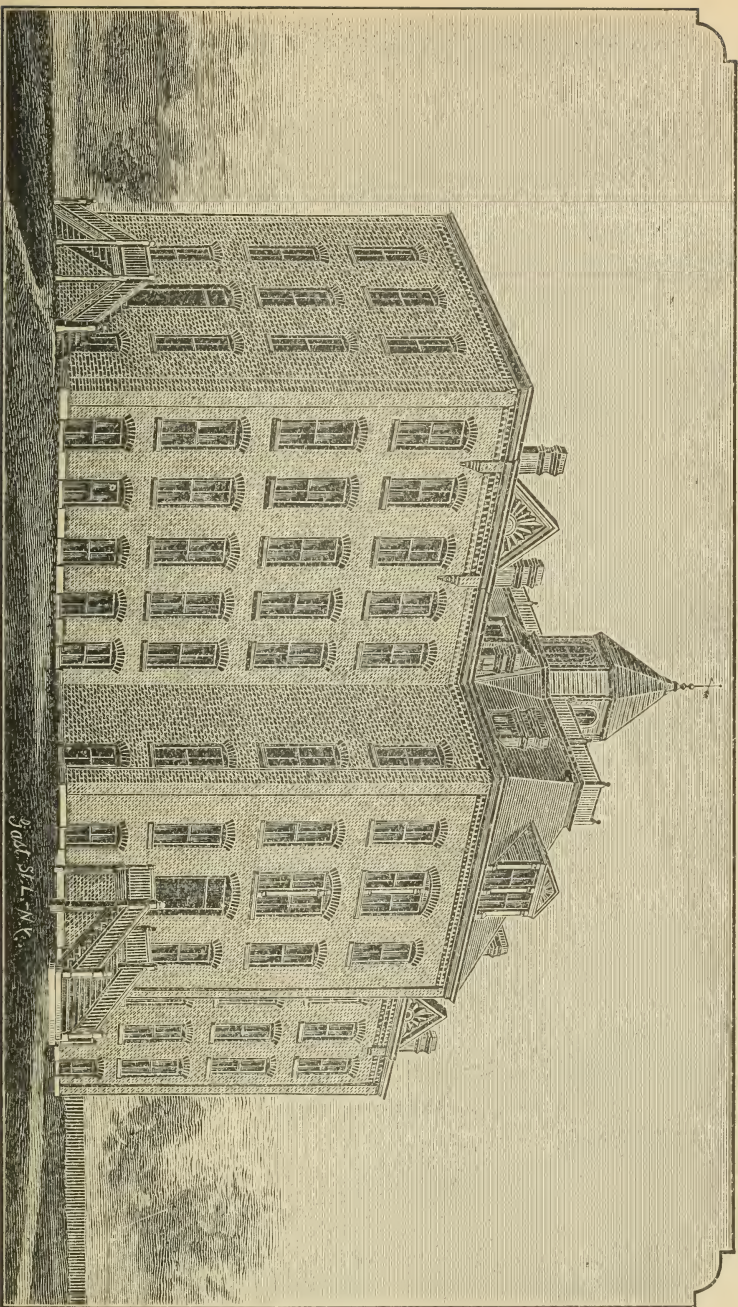


THE MAIN BUILDING OF THE UNIVERSITY OF THE STATE OF MISSOURI
[Destroyed by fire January 9, 1892.]



RUINS OF THE MAIN BUILDING

JOHN, S. L. - NY.



UNIVERSITY CLUB-HOUSE

3rd St. N. C.

UNIVERSITY CALENDAR.

1892.

September 8, 9, 10, 12	Entrance Examinations
September 13, Tuesday	All Academic and Professional Schools (except Law School) Open
September 16, Friday	Reception of Y. M. C. A. and Y. W. C. A. Law School Opens.
October 4, Tuesday	Open Session of Bliss Lyceum
October 29, Saturday	Athenæan Society Open Session
November 12, Saturday	Inter-Society Contest
December 10, Saturday	Union Literary Society Open Session
December 17, Saturday	Close for Holidays
December 22, Thursday at 12 o'clock noon.	

1893.

January 3, Tuesday at 9 o'clock a. m.	Reopen
January 21 to January 30	Examinations at Close of First Semester
January 31, Tuesday	Second Semester Begins
February 13, Saturday	Open Session of Young Ladies' Society
April 8, Saturday	Prize Declamation Contest
May 20 to May 29	Final Examinations
May 27, Saturday	Stephens Medal Contest
May 28, Sunday	Baccalaureate Discourse
May 29, Monday	Closing Exercises of Law School
May 30, Tuesday	Curator's Meet.
May 30, Tuesday	Address before Societies.
May 31, Wednesday	Oration before Alumni
June 1, Thursday	Commencement

SCHOOL OF MINES.

1892.

June 9, Thursday, 10 a. m.	Annual Commencement
September 19, Monday, 10 a. m.	Entrance Examinations
September 20, Tuesday	First Term Begins
November 24, Thursday	Thanksgiving Holidays
December 23, Friday	Christmas Holidays Begin

1893.

January 3, Tuesday	Exercises Resumed
January 23, Monday	Mid-Year Examinations Begin
January 28, Saturday	Mid-Year Examinations Close
January 31, Tuesday	Second Term Begins
February 22, Wednesday	Washington's Birthday Holiday
May 29, Monday	Final Examinations Begin
June 6, Tuesday	Final Examinations Close
June 8, Thursday, 10 a. m.	Annual Commencement

1892

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HISTORICAL STATEMENT.

The University of the State of Missouri was located at Columbia, Boone county, on June 24, 1839, by commissioners appointed and empowered to select a site under an act of the General Assembly of February 8, 1839. The main building was begun in 1840, and courses of instruction in Academic work were opened on April 14, 1841. A Normal department was established by act of March 11, 1867. The College of Agriculture and Mechanic Arts and the School of Mining and Metallurgy were made a department of the University by act of February 24, 1870. The Law department was opened in October, 1872, the Medical department in February, 1873, and the Engineering department in September, 1877. The Experiment Station was established under act of Congress of March 2, 1887. The Missouri State Military School was created by act of the General Assembly in the spring of 1890.

The foundation and the maintenance of the University rest on:

- a.* The old Seminary fund, \$122,000, at 6 per cent;
- b.* The new Seminary fund, act of March 29, 1872, \$100,000, at 5 per cent;
- c.* Congressional Land Grant fund, act of July 2, 1862, \$317,000, at 5 per cent;
- d.* Appropriations for specific purposes by the State Legislature;
- e.* The property received from the citizens of Boone county to determine the original location, \$207,900;
- f.* New building subscription by citizens of Boone county in 1892, \$50,000;
- g.* The United States Experiment Station fund, \$15,000 per annum;
- h.* Fund from the act of Congress of August 30, 1890, for the year 1892-93, \$18,000*;
- i.* The Anthony W. Rollins Aid fund, interest on nearly \$40,000;
- j.* The James S. Rollins Scholarship fund, \$6,000, at 5 per cent;
- k.* Endowment granted by the 36th General Assembly, \$646,946.23, at 5 per cent;
- l.* Various gifts by individuals as foundations for prizes.

*Less one-sixteenth, appropriated by special act to Lincoln Institute at Jefferson City.

REPORT OF THE BOARD OF CURATORS.

To his Excellency DAVID R. FRANCIS, *Governor of the State of Missouri*:

SIR—In compliance with the provisions of section 8751 of the Revised Statutes of Missouri 1889, the Curators of the University of the State of Missouri have the honor to submit the following report of the progress, condition and wants of the Institution for the year ending June, 1892.

Separate reports of the various departments of the University exhibiting the course of study prescribed in each, and the number and names of officers and students, the amounts of receipts and expenditures for the year ending December 31, 1891, together with much other useful information, will be found in their proper order in the following pages of this report:

For convenience, the following facts are here condensed.

Total number of students enrolled during the year at Columbia.....	631
Total number of professors employed during the year at Columbia.....	25
Total number of assistants employed during the year at Columbia.....	23
Receipts for the year ending December 31, 1891.....	\$130,388 69
Disbursements for the year ending December 31, 1891.....	\$120,139 25
Total number of students enrolled during the year at Rolla.....	83
Total number of professors employed during the year at Rolla.....	4
Total number of assistants employed during the year at Rolla.....	4

In our last report, for the year ending June 30, 1891, reference was made to the labors and responsibilities of the Curators in the management of the University without a President. In that report, in anticipation of the important change soon to take place through the election to the presidency of Prof. Richard H. Jesse, of Tulane University, we used the following language: "By direction of the Board he will be inaugurated at the chapel in the University on the third day of June, 1891. The occasion will be one of great interest to all, and we think a singular good fortune to the University. President Jesse is a ripe scholar, having enjoyed the highest advantages the best colleges of the United States could bestow, to which he has added the opportunities of foreign travel. President Jesse is a man of broad views, of excellent judgment of men, possessing fine common sense and tact in the management of business. He possesses special executive ability." These

things we stated as a conclusion based on the testimony of "men of eminent character and of great scholars and educators."

But great and rare qualities of person and mind, however improved and strengthened by the discipline of exercise and the acquisition of the highest learning, do nevertheless sometimes fall below a just expectation in the moment of actual trial. Some touch of nature is wanting; there is suddenly developed some latent defect of disposition, or the surrounding conditions prove inharmonious to former experience. It is considered less difficult to select a successful president of the United States than a successful president of a great university. So varied, weighty, difficult and delicate are the duties of the position, and so full of activities urgent every moment, that few men are born with the disposition and excellent combination of talents, improved by the requisite study and experience, to fill it suitably. For this reason every change of management excites grave apprehension as to the result. It is matter of intense satisfaction that the University has safely passed this ordeal.

Being yourself present at the inauguration of President Jesse, you know how happy were the auspices of that occasion. It is sufficient here to state that every promise of that day has been fulfilled. President Jesse has justified the learned friends who had confidence to indorse him to us unreservedly, and his executive management and admirable address to every condition that has presented itself, has answered the expectations raised by the noble character and eminent scholarship that first attracted us to him. Under his control, brief as it has been, the progress of the University has been steady and rapid. He is a diligent worker as well as careful thinker, and no detail of University management escapes his observation. Under his direction it is believed that the success of the University heretofore attained will be upheld and increased to a measure proportionate to the demands of the situation, and to all the moral and material aid which the State may afford her greatest educational institution.

With language too feeble in our last report, we sought to express our idea of the importance of a learned and able Faculty. We here recur to the principle to emphasize it, and to preserve in the life of the University its persistent activity. A thousand pigmies may bind one giant, but they can never create anything greater than themselves. Little minds breed little ideas. Small dispositions cramp and dwarf generous and noble young minds placed under their control at the most impressible and imitative age. For it is the nature of youth to listen to what it hears and to conform to what it sees, and thus to reveal in after years a similarity, both in measure of force and style of conduct, to those immediately directing it. It is safe to conclude that the ideas and principles instilled into the hearts of young men, the example daily given them by their instructors, the loftiness of purpose, nobleness of ambition, purity of intention, intensity of disposition and integrity of character, or the opposite, must in a very great measure determine the scope and color of their lives.

The limit of purpose and height of achievement are most often fixed by early conditions, and not infrequently the difference in lives is the difference in teachers. Dollars cannot measure the value to youth and the State of the permanent and magnifying power of a great and good instructor. It is most fortunate that this fundamental and pregnant truth is given full recognition and practical effect by the President of our University. It is a guiding principle with him that the mind and character which through our University system is to mould and form the minds and characters of the students shall be both noble and true, broad, generous and upright, stable, forceful and elevating.

In this measure, the Board are in hearty and practical sympathy with the President, and in the election of professors it is their policy to confer fully with him, so as to secure that ability, character and harmony of administration that shall prove most useful in building up the University. In this co-operative movement, the State is also a practical party. For every enterprise, whether moral, spiritual, intellectual or social, in like manner with material, is influenced by the pecuniary aid it receives. Integrity, character, ability and learning in the collegiate market are subject to the same laws that honestly affect commodities. The greater the man, the more pre-eminent his moral and intellectual worth, the greater must be the salary to secure and retain him, other things being equal. Colleges seek him and persuade him with increasing offers till the ablest secures his invaluable services. Missouri cannot abrogate nor mitigate this commercial feature of social and intellectual interchange. It is as pervasive as it is reasonable. It is hoped, therefore, that the State will continue to take a broad and liberal view of this matter, and make the necessary appropriation to enable the Board of Curators to deal justly by the members of the Faculty, and as occasion requires to employ the ablest men in University work. The University is sustained by many able professors. To retain them, we must deal with them as fairly under all the circumstances as like institutions deal with others.

Suitable buildings and equipments are required for the utmost success, but the first necessity is able teachers, great professors. In this matter it is our opinion that the present prosperity of the University and the encouraging outlook for the future fully justify the Board in giving great prominence to the strength of the Faculty, and our purpose continually to support this feature of administration as occasion requires. We neither claim nor promise perfection. We announce an important principle, and earnestly seek with the light and means at our command to enforce it.

The popularity of the work of the University, and its signal success, as evidenced by the increased attendance at this session, is matter of pride, not only to the management, but also to all the people of the State. Missouri, now more than ever, is devoted to the interests of higher education. The hearts of the people beat in unison with the desire for a grand institution of learning that shall give unexcelled power for development and progress, and shall be their crowning glory in the Mississippi valley. They have lifted the University to its legitimate legal status of the first

institution of the State. They have made it the State University. They have entered upon the policy of endowing it, and they recognize their duty and interest to maintain it liberally and suitably. They, therefore, have a right to expect an expansion proportionate to the effort being made. Such has been the case. The growth of the institution in every respect is encouraging. The number of students at this session is 631, being 51 more than any previous year of the fifty-three years of the University's history; and in our opinion, but for the burning of the main building in the midst of the session, the number of students might easily have reached 700. With a continuance of the present vigorous policy by the State and the University itself, when the new buildings are erected and properly equipped, there appears to be no reason why the student corps should not in a brief time attain to twelve or fifteen hundred. The State of Missouri, by her situation and natural advantages, with the noble character and public spirit of her people, deserves this splendid accomplishment, and it is the ambition of all connected with the immediate control of the University to attain this end. Missouri should never pause for a moment in her onward movement, until none can mention her name or celebrate her glories without giving first thought and consideration to her great University. For at last it is great minds that most adorn a state, and elevate it far above the grandeur, fruitfulness and beauty of nature in the achievements of history and permanent beneficence of true glory. All experience carries this testimony. Intelligence discounts nature. A country is known by its men. The university is the creator of power—the power of thought—and elevated thought is the inspirer of sublime conduct. A country without great schools is incapable of lofty enterprise, and buries its annals with its years, leaving neither name nor memories to redeem it from oblivion.

It is equally true that the system of education which does not tend strongly and persistently to sustain and nurture the moral virtues and higher spiritual aspirations of mankind is not only deleterious to the social structure, but injurious to the State. A government can be no better than its people, whatever its form. A country cannot rise superior to its homes, nor defeat the inevitable influence of its schools. That which is sown in the university shall surely be reaped in the field, shop and factory; in the forum, on the rostrum and the hustings. It spreads everywhere and touches everything—the sacred vestments, the judicial ermine, the pulse of commerce, the thrift of business, the course of law and the fundamental institutions, the public credit and the national honor. If education is power, still it may be for evil as well as good. Society has reason to dread the power which learning and culture confer on the reckless and misguided. It is not disloyal to higher education to aver that the pathway of science which leads the youth away from the door-yard of the old home where he learned the first lessons of truth and goodness were better never to be trodden. A highly educated and brilliant adept at scorn of the plain and simple ways of virtue, truth and honor, or skilled to trifle with the sacred assurances to the deep yearnings of the soul for

a nobler attainment and ultimate higher development, is destined to become a merciless vulture upon the vitals of the very institutions that give him prominence. It is this reflection that affords the profoundest pleasure in referring to the high order of moral discipline prevailing among the corps of students at our University. It is no easy task to govern and adjust all affairs of theory and practice among 600 students and many professors with varying dispositions, tastes, interests, conditions and ambitions, and to hold the general progress to the universal course of right and the sure unfolding into permanent form of the nobler impulses of human nature. But it is believed that the University in this measure of excellence does not fall below any similar institutions in the country. Within its walls is the greatest safety that can be given the university student. And it is the fixed policy of the management to shape all organized efforts to the promotion of the highest moral attainment and a pure and lofty patriotism.

Expansion—New Departments.

The rapid expansion of the University, as well as a proper policy of gradual development of University facilities and utilities, has caused the establishment of several new departments and the strengthening of others. And this is a policy that ought to be persistently pursued until the University of Missouri shall afford the opportunity, in equal measure and with equal aids with the greatest colleges, to acquire all the knowledge that can be gained at any institution in the United States. And until this is accomplished, the State will neither have done its duty to its people nor acted up to the full measure of its dignity and responsibility. A poor university is poor economy in this rich and rapid age. To postpone from year to year establishments and improvements that ought to be instituted at once by energy and a reasonable outlay is a reckless waste of time and opportunity. Besides, students cannot be deceived. They know what constitutes a university, and to them it is a sad discouragement should they discover that any essential or eminently useful thing is absent, or that any department is defective in professional superintendence or material equipment. The work is the work of the State, and it should be organized with that vigor and completeness, and conducted with that force and efficiency that will answer the dignity of the commonwealth and the demands of this precise and exacting age. The world has made more true progress in the last hundred years than in all the previous ages. The world now waits for nothing. Its anxieties for improvement are intense and its discoveries are sudden and startling. It meets every emergency and it meets it with scientific precision and lightning rapidity. And the University that is not organized in full complement with the wants and progressive spirit of the age will receive the frown of the age. It cannot and ought not to succeed. A piece of a university is contemptible. The Curators could not make the sacrifices of time and business required of them were it not for the comfort of the

assurance that our great State is fully awake to the interests of higher education, and is now prepared and anxious to supply the means necessary to an earnest and careful administration of the University. With this encouragement the Board of Curators are inspired with new energy and the hope of successful effort.

Normal Department.

In 1867, the Legislature passed an act authorizing the Board to establish a Normal department, and requiring them to employ a professor. But no provision was made for payment of salary, and the position remained vacant, its duties and responsibilities meanwhile being assigned to the department of English, already burdened with its own labors. But, for the time, no better disposition could be made. However, the Board on the 3d day of June, 1891, elected Professor J. P. Blanton to this chair, and he entered upon its duties at the beginning of this session with great zeal and energy. He has given the department great prominence, and made it very attractive and influential. Through it the University is being brought into touch with the public schools and public school teachers of the State. Unfortunately in former years it has seemed to be inconvenient to the University management, doubtless for want of means, to institute a close and confidential relation with the vast body of public school teachers of the State, numbering about fourteen thousand. In this all have suffered, but doubtless the greatest sufferer has been the University. But it is evident that the University can never succeed to its full measure until it merits and receives the approbation, friendship and assistance of the organized educational forces of the State, as well as the general popular favor. The University is based on the general intelligence and educational work of the State. It cannot go forward as it ought without the support and help of the army of teachers of the State. Whose duty is it to take the initiative? It is certainly the duty of the University. It belongs to it to solicit the acquaintance it so much needs and the friendship which no money can purchase. It is to be won by presenting the University to the schools where the schools are, and in state, district and county institutes; by the University seeking good will by showing good will. For we cannot like those who show indifference to us, to our feelings and to the affairs of our lives.

By the institution of a Normal department the public school teachers are now given a direct and proprietary interest in University work. It is their department, for their special benefit; and with an energy that is tireless, Prof. Blanton is seeking to make known the superior advantages of this department in connection with the great library and other departments of the University, all of which are fully open to all students. It is the design speedily to increase the teaching force in this department, and make it fully equal to the demands which are now pressing upon it. It is our opinion that the establishment of this department was most wise, and that through its expansion is speedily to come great increase in number of students and popular favor to the University. Eventually its work

must be of such a high order as to make its diploma of inestimable value to the student and the high schools of the State. This department cannot be given entire and complete working efficiency until it is supplied with a High School for purposes of a model school, for which provision should be made at as early a period as possible. Such a high school is to the Normal department what the laboratory is to the sciences. It is the work-room for the student for demonstration and illustration, and for improvement by observation of just and reasonable methods of childhood government and instruction. Its importance cannot be over-estimated.

Commercial Department.

Believing that a regular system of book-keeping, correct business habits, and a course of commercial study, are an essential part of the education of every young man preparing himself for the duties and cares of life, the Board established a Commercial department, and on the 18th day of September, 1891, elected Prof. M. S. King to the same. The department has proved to be exceedingly popular, and speedily filled up to the full measure of Prof King's time. It is evident that the students fully comprehend the practical advantages to them in future business life of this department. As soon as possible, it should be expanded to meet the requirements of a full school and the number of students who desire its course of instruction. Opportunity should be equal to the demand.

This is the age of pen and ink. In all business transactions, memory is almost dispensed with. In disputes in court, in investigations, the man with the book beats the man with memory alone. The book of account is the arbiter. This is also the age of accuracy. The careless man, the bookless man, the inkless man fails. The accurate man succeeds. Business is careful, margins are close. The dealer, the trader, the manufacturer, the professional man, the farmer, all need the preserving memory and tell-tale disclosures of the orderly account.

Only this can reveal the profit or loss of a business and authorize its continuance or discontinuance. Book-keeping brings writing and arithmetic together in a partnership of demonstration of the effect of every fact and detail upon the final result of a long process, giving personal satisfaction, preserving friendship and preventing law-suits. Great business cannot be conducted without it, and every small business is more profitable with it. It opens the way to a young man to immediate and paying employment.

It deserves such encouragement in the schools as to become universal in acquisition and habitual in practice. It is designed to be a common feature of education at the University.

Department of History and Political Economy.

The Board also established a Department of History and Political Economy, and on the 16th of December, 1891, elected Dr. Frederick C. Hicks to fill the same. This is esteemed one of the most important meas-

ures adopted by the Board. No separate department for instruction in these studies has ever before existed in the University. The only instruction given in them was irregular, and dependent upon the opportunities of the several professors in some collateral line of study.

Yet it must be conceded that nothing more strongly tends to prepare one for the high duties of citizenship than a knowledge of the history of one's country and of mankind, and of the great and leading principles of business, and of social and political stability and progress, on which rests the happiness of all civilized peoples, and which determine, regulate and bound the formation, growth and power of nations. Particularly is the knowledge and discipline gained by a systematic course in these things becoming and necessary under a republican form of government, where the mind of every citizen enters continually into the ceaseless current of political action, which defines and tempers the rights and liberties of all. If the people are to be and remain sovereign, to sustain popular liberty under constitutional forms rendered effective by honest political habits and traditions—if civilization of a noble and stable character under democratic institutions, sacredly protecting the rights of property and person, is to become and remain the permanent happiness and glory of mankind—then it is essential that the universal mind shall be made habitually to comprehend the basic and eternal principles of liberty and right government, of the inalienable rights of person and the reasonable limits of state authority and action over the citizen, and the equally fixed methods of business prosperity discovered by the experience of mankind through ages of struggle up to the light and life of modern times.

The impending danger over all governments to-day is the inability of many to make a broad survey of the real causes affecting their condition, and to comprehend what are the possibilities and impossibilities of relief by governmental action. Hence they are subject to that irritability, envy, desperation and revenge that pertains to immature knowledge, attended by a consciousness of wrong. The remedy is enlightenment. The situation demands the conscious strength of correct principles, of habits based on firm knowledge, of that self-possession springing from the convictions of truth. The people need the light and assurance of history, and the guide-posts erected by the universal experience of the race.

The universities cannot afford to neglect their opportunities in this field of service to mankind and the cause of free government and economic science. It is fitting that the people who sustain with their means institutions of higher education should receive back from their schools the well-prepared youth, to advocate and sustain in their midst right views of political proceedings and the true principles of business prosperity. Besides, for self-respect and personal happiness, it is a shame that any young man should quit his Alma Mater ignorant of the history of his own country and its fundamental principles. From the importance of the matter, we feel confident that the action of the board in establishing the chair of History and Political Economy will be approved. The effect

will be to greatly extend the power and usefulness of the University and to draw to it many students who otherwise would leave the State, for the opportunity to pursue their studies at other colleges.

Acts of Congress July 2, 1862, and August 30, 1890.

By the land grant act of the United States of July 2, 1862, the equivalent of 330,000 acres of land was donated to the State for the purpose of establishing an Agricultural College, embracing instruction in agriculture, military science and tactics and the mechanic arts. It was intended that the proceeds of this grant should be used only for maintenance, and that the State should supply the buildings and equipment. The State, by act of the General Assembly, accepted this trust and assumed entire control of the trust fund. By act of the Legislature of February 24, 1870, the Agricultural College, with the School of Mines and Metallurgy, was established as a department in the University. At a later period the Military department was developed, and under the patronage of the State, and presided over by able and accomplished officers of the United States army, detailed by the Secretary of War, is most successful. In this the design of the United States has been fully accomplished.

But the School of Mechanic Arts has been for nearly thirty years wholly neglected by the State, it having made no provision whatever for its institution or support. But by act of August 30, 1890, the United States Congress made further and liberal provision for the Agricultural College. This act yields an annually increasing amount from \$15,000 in 1890 up to \$25,000 when the latter sum becomes a fixed annual income. Of this amount Lincoln Institute receives a part, in the ratio of the colored children to the white children of the State. The School of Mines at Rolla, as a part of the Agricultural College, receives 25 per cent, and the remainder goes to the Agricultural College at Columbia. By means of this unexpected income, without any aid from the State, the Board have been enabled to establish and put in operation in the Agricultural College at Columbia the Normal department, the Commercial department, the Department of History and Political Economy, and also a

School of Mechanic Arts.

Or Manual Training School. This latter deserves an emphatic notice. It is an entirely new feature in university work. The first Manual Training School established in the United States was due to the thought of Dr. C. M. Woodward. It is a part of Washington University, at St. Louis, and he is its present Dean. The fame of that school is national, and Dr. Woodward is everywhere recognized as the originator of the system. As a member of the Board of Curators, he has taken a deep interest in the organization of the Manual Training School in the University. This in itself is a guaranty of the very best form. And he has stated that it is as well equipped and ably conducted, so far as developed, as any school of its kind in the country.

On the 3d day of June, 1891, Prof. C. W. Marx was elected by the Board Superintendent of the school, who gives instruction in the theories pertaining to his department, and also superintends the manual work. Prof. C. B. Rearick is instructor in drawing.

About five thousand dollars have been expended in equipping this department. It was first located in the basement of the west wing of the main University building, and was burned out. Most of the equipment, however, was saved, and the school is now conducted in a leased building. A separate and suitable brick building will be erected on the campus this summer, ample for its accommodation and free development.

The course in this department is intended to cover four years, and embraces four rooms or stages of progress, viz.: plain wood-work or joinery, wood turning, work in cold iron and the forge-room. It is no part of the scheme to manufacture anything for commerce, but to give practical instruction to the students in drawing and in the use of tools of every kind, and in the construction of all the forms and patterns of wood and iron work. Thus are educated together in the most natural and easy way the brain, eye and hand, developing at once the sense and method of useful form, and evolving ideas, mental conceptions and intellectual processes into the material of practical life. The scholar is also a mechanic. While he thinks, action is present. While he studies, he learns to do. He comprehends the necessity of mental and physical co-operation as equal elements of success. He creates or preserves habits of industry. He prepares to help himself in after life as occasion requires. He is rendered independent. This condition makes him confident and self-reliant. Gradually it dawns upon him that study and toil are only different applications of the same intelligent force, of like merit, and worthy equal honor. Thus the first principle of good citizenship impresses itself upon him. Every one must do something "to earn a night's repose." He perceives that an idle philosopher is not so valuable to society as a chimney-sweep, and that truth dormant and inactive, however great, is of less value than junk or old rags on the way to market.

The workers move the world to-day. All the mighty forces that once poured through the gates of civilization in ruinous war are now engaged in wonderful competitive activity in commerce, construction, art and manufacture. The man that can think and do in this age must surpass the man trained to think but not to do. The hand of industry is every hour growing into greater comparative importance. Hitherto it has been committed for instruction to the minor schools and to tradition. It was denied a position by the side of the professions. Now the spirit of the age calls the industrial pursuits into the halls of the university, and crowns the hand of toil and the implements of industry with the same honor in which it clothes the bar, the bench and the forum. Thus passes away the cruel and barbarous period of personal preference, based on no merit but the accident of birth or calling—a monstrous imagination that has harassed and oppressed nine-tenths of mankind for centuries.

Seventy-three students have this year entered the Manual Training School, and a want of room prevented a greater number. The bounty of the General Government enables us to deal liberally with this department. There are no special charges for anything. Paper, pens, ink, drawing instruments, desks, models, wood, lumber, tools, work benches, metals, supplies, forges, and all the necessary and costly machinery and outfits, are furnished every student without cost, just as scientific instruments, maps, charts, technical books and suitable equipment are furnished to other departments. A substantial building, designed with special adaptation to the uses of this department, will be a strong feature upon the campus. This will be erected from means supplied by the State. Thus the State and Nation join in welcome of the industries to the home of the classics and sciences.

The Agricultural College.

From what precedes, it is evident that the Agricultural College in the University, embracing the School of Mines at Rolla, the Military, the Mechanic Arts and the other important schools mentioned, with yet capacity for still greater enlargement, and having at the same time control of the farm, the Horticultural department, and the Experiment station with its revenues, constitutes a strong element in university organization. The Curators have given it special consideration in the endeavor to foster its highest interests and bring to its support the popular favor its importance and merit demand. In a prominent position upon the campus it has a commodious building for its own special uses, heated by steam and hot air, repaired and improved throughout during the present year at a cost of over \$6,000, newly equipped for its work and elegantly appointed in every part. It wholly escaped injury by the fire. To-day the Agricultural College building stands alone, but soon will be one of a group of modern buildings, erected like itself for the special use of the several departments, and standing coequal with engineering, physics, medicine or law, and having an income greater than any other department. Seventy-one students, professional agriculturists, have this year entered this department, and are pursuing a special and technical course of study to equip themselves for their life work, in like manner as medical or law students, either of which schools they excel in number.

The Agricultural College is succeeding far beyond expectation in its own special work and professional course; and when it is allowed that by legal association and community of organization and support from the same fund, there are due to it the courtesies of the School of Mines, the Military School and School of Mechanic Arts, its interests, power and influence as compared with the other departments are imposing and of wide range. In former years it has been impeded for lack of sufficient means to meet its necessities, the physical sciences being very expensive as compared with the classics and similar learning. But for the present the income of the Agricultural department is deemed ample for the pay of its professors and for all the "facilities for instruction," to which uses

alone it is limited by law. It will therefore be inexpensive to the State, except for buildings and fixtures.

It is our opinion that time will prove the wisdom of associating together all these departments of learning and building up one great University, instead of dissipating the energies of the State at far greater cost and loss of that massive effect produced by a grand unity, which is in itself a mighty influence over the imagination in fixing the attention, inspiring ambition, creating energy, exciting enthusiasm and impressing every one with the earnestness, zeal and self-respect that spring from the combined power of all. Besides, all learning is of the same nature, all truth is of the same essence, and all students far into life pursue the very same studies and investigations. Only when the practical demands for business and subsistence begin to press do they differentiate into law, agriculture, mechanics, medicine and the various specialties. Moreover, the association of all the schools multiplies the influence and benefits of each, and through acquaintance and friendship draws together the young men of the State, producing a good understanding, obliterating local prejudices and follies of business distinction, and creating a spirit of toleration and mutual self-respect. Agriculture, far from suffering by this association in the University, must itself, by the inherent purity, beauty and beneficence of its learning, in which is nothing evil, tend to the advantage of all other departments, and they have a deep interest in its permanent presence upon the campus.

The Fire.

The burning of the main building on the 9th of January, 1892, is now a matter of history, as is also the action of the 36th General Assembly in making provision by creation of a building fund of \$237,000 for the erection of new buildings at Columbia, and for equipping the same, and the purchase of a new library.

The Insurance and the Building Fund.

The insurance upon the buildings and their contents amounted to \$147,500, all of which has been collected and paid into the State treasury except \$923, salvage allowed the insurance companies on settlement by the appraisers of the loss on scientific instruments and apparatus, some of which were saved. The remainder of the building fund consists of \$40,000 transferred from the "State Insurance Department fund" by said act, and \$50,000 subscribed by the people of Columbia and Boone county "In aid of the State University Building fund," thus making a total building fund of \$236,577.

Subscription of the People of Columbia and Boone County.

The subscription of \$50,000 by the people of Columbia and Boone county is collected and in the hands of private parties appointed by the subscribers for this purpose, except a small amount, delay in payment of which was caused by the death of the subscriber, which made the allow-

ance of the same in the probate court necessary. But I am informed that the entire amount will be paid to the Curators within one week, or before the first day of June.

Water Bond.

"The Inhabitants of the Town of Columbia," being a corporation by that name, has executed and delivered to the Curators the bond provided for in said act of March 24, 1892, obligating it to "provide and furnish a water supply at once for said University buildings," etc., on the University campus. Said bond being for the protection of the State's interest, the same was referred to the Attorney-General, Hon. John M. Wood, and he has given a written opinion, now on file with the Secretary of the Board, that the bond is in due form.

The New Buildings.

The Curators, after careful study of the locality, have adopted a campus plan for the main building and such departmental buildings as may be erected now and in the future. The buildings will be erected upon a quadrangle extending lengthwise from north to south, and being 300 feet wide—the west line facing with the east wall of the Agricultural College building, which will form one of the group, and which is really the initial point determining the position of the other buildings.

The new main building will stand to the south of the position of the old one and at the head of the quadrangle facing north. The main building cannot be erected at present. It is estimated that it will cost \$300,000, and the 37th General Assembly will be asked to appropriate that amount for the purpose. No plans, however, have been drafted for this building.

The buildings which the Board have resolved to erect out of the building fund now authorized are six in number, viz.: a boiler and engine house for heating and power purposes, a building for the Manual Training School, a building for Physics and Engineering, a building for Biology and Geology combined with a Museum, a Chemical laboratory and a Law building. The Physics building will stand on the west side of the quadrangle, about 55 feet south of the Agricultural College building; the Manual Training School building will stand south of the Physics building about 50 feet; the boiler-house will stand south and west of the last named building. The other three departmental buildings will stand on the east of the quadrangle. All will face upon the enclosed area. The plans for the first three buildings named have been adopted and the advertisement for bids to erect the same is made, but the time has not elapsed. The plans for the other three buildings are now being prepared by the architect, and will be ready in a few days for action by the Board. These buildings will be pushed to completion as rapidly as possible.

The first object in construction has been to secure sufficient room for the departments, with the greatest convenience and economy of arrangement possible. It is believed also that the architectural effect will be pleasing, especially when the main building is in its place. The Board

selected Mr. M. F. Bell, of Fulton, as architect and superintendent, in accordance with said act, at the compensation therein mentioned.

Material Saved.

The walls of the burned building have been taken down and the grounds cleared up. The net value of the stone and brick and iron saved from the wreck which can be sold or worked into the new buildings will be about \$4,000.

Library.

The entire library was lost except a few books in the hands of professors at the time, and except a considerable portion of the law library, which being in the west wing of the building was saved. The law library was damaged about one thousand dollars. These books the Board have ordered to be supplied, and the purchase will soon be made. The insurance on library and cases was \$11,000. It is the intention of the Curators to reinvest this amount immediately in a new library, and to add to it several thousand dollars. While this amount may not equal the cost of the old library, it is believed that the new library will prove much more select and satisfactory to the students. The Faculty have been authorized to prepare a list of books for purchase this summer, so as to have the new library open at the beginning of the next session.

A large and well-selected library is of the first importance to the success of the University, and it should equal if not exceed for the present fifty thousand volumes. No one feature in university equipment is more useful or more pleasing and satisfying to students. The very existence of such a force and aid attracts students. Thoughtful and investigating minds will not be content without it. The Missouri University cannot afford to be less enterprising in this respect than other similar institutions. The State could not better serve itself than by the expenditure of fifty thousand dollars in the creation of a splendid library at the University. It would attract to it minds of large caliber and earnest men pursuing investigations and post-graduate studies.

Scientific Apparatus.

All our scientific apparatus was lost in the fire except about \$923 worth. This was a great misfortune to the current year. It could not all be replaced in time to meet the wants of the classes. Some of the most needful, however, was purchased in time.

As soon as possible, it is the design to equip each department in the most efficient and complete manner, so that the University of Missouri shall not be adjudged less progressive and less enterprising than other schools of like character.

The Museum.

The fine cases and specimens on the second and third floors of the museum were lost in the fire, it being impossible to remove them. But a part of the large specimens on the first floor were saved by taking them out

through an opening made in the wall for the purpose. The elephant was thus saved, though somewhat damaged. The remnants of the museum are now preserved in a frame structure, erected temporarily for the purpose. The insurance on the specimens was \$3,000, which will be used in repairing them and supplying those lost. With this amount it is thought the museum can again be made useful and attractive, though a much larger sum could profitably be expended in this direction.

Additional Expense from Fire.

The burning of the main building caused many unexpected expenses. These could not be avoided, and, of course, had to be met out of the ordinary maintenance fund. It is the purpose, however, to keep the biennial disbursements within the appropriations, and if we succeed in this it will be an attainment resulting from the most careful management.

Leases.

It has been necessary to provide new and temporary quarters for some of the departments. In this emergency, the Agricultural College building has extended its courtesies to some, also the Medical building, which was repaired for the purpose. The town of Columbia furnished free of rent for chapel exercises the splendid and elegant hall known as Haden's opera house. Other necessities for room had to be met by lease of suitable buildings, and this system will be continued until the new buildings are completed.

Records.

The records of the University corporation, with all the papers pertaining to its history and current business, were saved without loss. These, being conveniently situated, were removed from the vault; otherwise they must have been destroyed, as the vault proved to be insufficient against the intense heat. The saving of the records is due to the carefulness and energy of the Secretary, J. G. Babb, who, as soon as he perceived that the fire was beyond control, organized a force for their removal.

It would be a sad injustice in this report were proper mention not made of the prompt and noble conduct of the people of Columbia, and the spirited and manly action of the students and professors, on the occasion of the fire. The people immediately by a common impulse threw open to the uses of the University every available room and hall free of cost, sparing no effort to lessen the misfortune, and to protect to the utmost the interests of the State. And it is a great satisfaction to the Curators to recognize their generous action and public spirit.

The President and Faculty also exhibited such energy and good judgment as merits and elicits the highest commendation. And the manly and prudent conduct on the part of the students excites our highest admiration. Without exception they stood by their duties, deeming it more worthy to suffer affliction with the University in its sorrows than to desert their posts. The fire occurred about 7:30 o'clock p. m., on Saturday, and on Tuesday morning at 9 o'clock every student answered to

roll-call, and every class was heard in its newly appointed place, just as if nothing had occurred. This is conduct worthy of Missourians, and it challenges the admiration of all who know the value of brave and honorable behavior under severe circumstances. It is proof of the noble and dutiful spirit nurtured and developed at our University, which promises that safety and honor to the State which is due to manly spirits and brave hearts.

In front of the main building, eighteen feet from the wall line, stood six stone columns on a raised platform, and supporting the portico. They are separated from one another by a space of ten feet on a straight line from east to west. Their diameter is four feet eight inches, and their height is thirty-seven feet to the capitals that crown them, which are four feet high. They are of the Ionic order of architecture, massive and simple. The heat from the burning building so affected them that they are now scaling deeply on the side that was nearest to the fire, giving them the character of a ruin, and telling in silent eloquence the story of the sorrow that befell them on January 9, 1892, when the flames destroyed the grand structure to which they were mated and left then standing alone. They are now the only memento upon the campus of the old University building, which was erected over fifty years ago, and preserve in their scarred and crumbling magnificence the one feature by which the long line of students that have passed out from these scenes can recall the likeness of their Alma Mater. They will be left standing just as they are, in the very midst of the area around which will be grouped the new buildings.

Between these columns, through the wide entrance to the spacious rotunda of the old building, in years gone by, have entered into the University more than fourteen thousand students. As they approached up the broad aisle leading over the campus, the very first thing that caught the eye, and impressed the imagination, was these magnificent columns. Dull indeed was the soul and unfit for the learning of those grand halls, upon which they did not impress themselves with deep and sacred effect. They will stand reflected forever in the hearts of the noble band of youth who here were initiated into the mysteries of that learning which endowed them with the power of cultivated thought, expanded their hearts to all the high claims of the divinest of social structures, and inspired their souls with a deathless ambition to rival and lead the world in the offices of patriotism and service to their country.

Fifty years have marked the ceaseless procession, coming and going, of this army of students. Year after year they have departed into the mighty throng of toil, bearing with them in the pursuit of fortune, and through all the mutations of business and the adventures of life, the dear memories of the scenes, associations, trials and triumphs of their college days. Many now adorn the social and political life of their State, some have given their talents to other states, while others, on sea or land, with distinguished service have borne the national honor. They are a scattered band of brothers. Life has brought them varied fortune, hardships.

to some, success and happy scenes to others, and some are beyond the touch and bitter cup of this great disaster.

But to all who think and feel, one sentiment is dear—the love of the old University and its fond recollections.

“Be it a weakness, it deserves some praise:

We love the play-place of our early days.”

Few hearts did not bend and few eyes did not moisten at the knowledge of this irreparable loss. For it is manly to feel deeply, and tenderness is a badge of nobility.

Let these columns stand. Let them stand a thousand years. Crown them with an arch, memorial to the men who in their magnificent presence learned what life and duty are, and how to live the one and do the other. They will be to all a rallying point of future devotion and service to the University. For surely the strongest bulwark around any institution is the ceaseless recollection and loving devotion of its intellectual children. No university can be most attractive and great till age has brought it this support. No argument persuades like sentiment, and no force impels like affection.

And these sad columns will in future also prove of deep significance and impressive force upon the column of new students, growing ever longer as time proceeds and the State makes greater provisions. They will walk up the broad aisle where their elder brothers walked, and, through these columns, bereaved of their former glory and tortured into ruins by fire, they will behold the new University, a nobler structure, with its associate buildings arranged on either side, the whole in proportion and on a scale worthy the expanded power and wealth and in fitting correspondence to the increasing dignity of the State.

Respectfully submitted.

G. F. ROTHWELL,

President of the Board of Curators.

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H. C. PENN, A. B.,

Assistant Professor of English.

GEORGE D. PURINTON, A. M., M. D., Ph. D.,

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Professor of Theory and Practice of Teaching, and Mental and Moral Philosophy.

JOHN M. BURNAM, A. M., Ph. D.,

Assistant Professor of Latin.

WALTER MILLER, M. A. (HONORARY MEMBER OF THE ROYAL ARCHÆOLOGICAL SOCIETY OF LEIPZIG),

Associate Professor of Greek.

GEO. A. WAUCHOPE, M. A., Ph. D.,

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Superintendent of Shop-work in Department of Mechanic Arts.

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Assistant in Manual Training.

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R. F. BRYAN,
Tutor in Modern Languages.

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Tutor in Modern Languages.

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- I—English.
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- III—Greek.
- IV—Modern Languages.
- V—Hebrew.
- VI—Sanskrit.
- VII—Comparative Philology.

B. SCIENCE.

- VIII—Political Science.
- IX—Mental and Moral Philosophy.
- X—Mathematics.
- XI—Physics.
- XII—Chemistry.
- XIII—Geology and Mineralogy.
- XIV—Biology.

II. PROFESSIONAL.

- XV—1. Agriculture and Mechanic Arts.
- XVI—2. Normal Instruction.
- XVII—3. Law.
- XVIII—4. Medicine.
- XIX—5. Mining and Metallurgy.
- XX—6. Engineering.
- XXI—7. Military Science and Tactics.
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Professor of History and Political Science.

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SILAS DINSMOOR,

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Tutor in Modern Languages.

R. F. BRYAN,

Tutor in Modern Languages.

G. L. BROWN,

Tutor in Modern Languages.

M. H. LOCKWOOD,

Tutor in Mineralogy and Geology.

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Tutor in Mathematics.

C. J. KEYSER, B. S.,

Tutor in Mathematics.

I. Department of English.

EDWARD A. ALLEN, Professor { H. C. PENN,
G. A. WAUCHOPE, } Assistant Professors.

The following courses are offered:

1 and 2. The principles of written discourse. Exercises and themes. Four sections, two semesters, two hours a week, Wednesday, Friday (Freshman). Professors PENN and WAUCHOPE.

Clark's Rhetoric; Lectures.

3 and 4. The History of English Literature, (1) from its Beginnings to the Restoration, (2) from the Restoration to the Present; and the study of masterpieces of representative authors from Chaucer to Tennyson. Parallel readings. Essays on literary and historical subjects. Two semesters, three hours a week, Tuesday, Thursday, Saturday (Sophomore). Prof. ALLEN.

Lectures; Nicoll's Landmarks of English Literature; English Classics.

For reference: Stopford Brooke's English Literature; Greene's Short History of the English People; Minto's Manual of English Prose; Ward's English Poets; Saintsbury's Elizabethan Literature; Gosse's Literature of the Eighteenth Century; Stedman's Victorian Poets.

5. History of the English Language. Theses. First semester, three hours a week, Tuesday, Thursday, Saturday (Junior). Prof. ALLEN.

Lectures; Lounsbury's History of the English Language; Sweet's Anglo-Saxon Primer.

6. Study of modern Prose style, based upon masterpieces of best authors. Essays. Second semester, three times a week, Tuesday, Thursday, Saturday (Junior). Prof. ALLEN.

Genung's Rhetorical Analysis; Prose Authors.

Required for L. B., courses 1, 2, 3, 4, 5 and 6; for S. B., courses 1, 2, 3, 4 and 5; for B., courses 1, 2, 3 and 4.

ELECTIVE COURSES.

7 and 8. Anglo-Saxon Prose and Poetry. *First and second semesters*, two hours a week, Wednesday, Friday (Senior). Prof. ALLEN.

Sweet's Anglo-Saxon Reader; Earle's History of Anglo-Saxon Literature.

9. Middle English. *Second semester*, two hours a week, Wednesday, Friday (Junior). Prof. ALLEN.

Morris and Skeat's Specimens of Early English, Part II.

10. Anglo-Saxon Grammar (Comparative). *Second semester*, two hours a week, Tuesday, Saturday (Senior). Prof. PENN.

11. Gothic. *Second semester*, two hours a week (Senior). Prof. WAUCHOPE.

Wright's Gothic Primer. For reference: Braune and Balg.

12. Anglo-French. *First semester*, two hours a week. Knowledge of Latin and French necessary. Prof. ALLEN.

13. Chaucer. *First semester*, two hours a week. Prof. ALLEN.

14. Shakspeare. *First semester*, two hours a week. Prof. PENN.

15. The Elizabethan Drama. *First semester*, two hours a week. Prof. WAUCHOPE. Thayer's Best Elizabethan Plays.

16. Principles of English Versification. One hour a week.
17. Course 5 (Lectures on the English Language) is open, as a Junior elective, in the A. B. course. First semester.
18. Course 6 (Modern Prose) is open, as a Junior elective, in the A. B. and S. B. courses. Second semester.

Seminaries in literature will be in charge of the several instructors.

A Post-graduate course is provided for students desiring to carry on further their studies in English. The following will indicate in a general way the work done: Beowulf (Harrison and Sharp); Cynewulf (Kent); Cook's Siever's A.-S. Grammar; Ten Brink's Literature; Skeat's Principles of English Etymology.

[Courses preparatory to the Freshman class are outlined in the schedule of preparatory work. They embrace Advanced Grammar, Composition and Rhetoric, and American Literature.]

A special medal, known as the "McAnally medal," is offered for the best essay, thesis or poem by members of the Senior class competing under certain rules laid down by founder of the prize. Subject for 1892-93: "Contemporary Fiction."

Enrollment of students in the English department, 1891-92: Collegiate (required and elective), 251; Preparatory, 284; in College of Agriculture, 81; in Teachers' course, 13.

II. Department of Latin Language and Literature.

Professor JONES; Assistant-Professor BURNAM; J. F. PAXTON, Assistant.

The subjects taught in this department are the Latin Language and Literature, the Geography, Mythology, Antiquities and History of the Romans.

1. Sallust. *First Semester*, daily at 9 (Freshman).

Text-books: Herbermann's Sallust, Allen and Greenough's Grammar, Allen's Prose Composition, Allen's History of Rome.

2. Cicero (Orations). *Second Semester*, daily at 9 (Freshman).

Text-books: Allen and Greenough's Cicero, Allen and Greenough's Grammar, Allen's History of Rome.

The aim of the above courses is to give the student facility in reading Latin prose. Daily practice in sight-reading will be given during this year.

3. Virgil. *First Semester*, daily at 12 (Sophomore).

Text-books: Greenough's Virgil, Allen & Greenough's Grammar, Prose Composition.

Lectures on Mythology will be given by the instructor.

4. Horace. *Second Semester*, daily at 12 (Sophomore).

Text-books: Wickam's Horace, Kirkland's Horace, Allen & Greenough's Grammar, Prose Composition.

Lectures on Roman Literature will be given by the instructor.

5. Livy or Tacitus. *First Semester*, Tuesday, Thursday, Saturday at 10 (Junior).

Text-books: Lord's Livy, Hopkins' Tacitus, Allen & Greenough's Grammar, Tighe's Roman Constitution. This course involves minute study of syntax and some attention to Latin philology.

All of the above courses are required of candidates for the A. B. degree, and all except 5 of candidates for L. B. degree.

ELECTIVE COURSES.

6. Cicero. Two hours a week, *first semester*. Prof. JONES.
7. Terence. Three hours a week, *second semester*. Prof. JONES.
8. Plautus. Three hours a week, *first semester*. Prof. JONES.
9. Syntax. A study of the Cases, Moods and Tenses. Remnants of Early Latin. Two hours a week, *second semester*. Prof. JONES.
10. Rapid reading of Latin prose. Two hours a week, *first semester*. Prof. BURNAM.
11. Rapid reading of Latin poetry. Three hours a week, *second semester*. Prof. BURNAM.
12. Roman Literature. Three hours a week, *first semester*. Prof. BURNAM.
13. Lectures on Roman Constitutional Law. Two hours a week, *second semester*. Prof. BURNAM.
14. Teachers' Course. This is intended for students who plan to engage in teaching. It is offered both semesters once a week. Hours of all elective courses to be arranged with the instructor.

Courses 6, 7, 8 and 9 are designed for such students as desire to study the historical development of Latin; Courses 10, 11, 12 and 13 are designed for those who desire to study the literature and antiquities.

PREPARATORY COURSE.

This course is intended for those students who are not prepared for the Freshman year (Course 1), and extends over two years.

First Year—Collar & Daniell's Beginner's Latin Book completed.

Second Year—Cæsar (De Bello Gallico), books II, III, IV, V, I.

Text-books: Kelsey's Cæsar, Allen's Prose Composition, Allen & Greenough's Grammar, Ginn's Classical Atlas.

The Roman pronunciation is used, and its adoption is urged upon all teachers preparing students for the University.

A prize is offered for competition in the Sophomore and Junior classes. It will be awarded in 1892-93 to the student who makes the best translation into Latin of Chap. I, McCarthy's History of Our Own Times, through the words "his early promise." At the Commencement of 1892 this prize was awarded to Mr. J. E. Goodrich.

Enrollment of students in the Latin department: in required courses, 285; in elective, 17.

III. Department of Greek Language and Literature.

Professor MANLY; Associate, Professor MILLER.

REQUIRED COURSES.

1. Xenophon: *First Semester*, Tuesday, Wednesday, Friday, Saturday, at 11. (Kelsey's Xenophon's Anabasis, Goodwin's Greek Grammar, Woodruff's Greek Prose Composition, Cox's History of Greece (Students' series), Kiepert's or Ginn's Classical Atlas.)

2. Herodotus: *Second Semester*, Tuesday, Wednesday, Friday, Saturday, at 11. (Herodotus, Book VII, Seemann's Mythology, Goodwin's Greek Grammar, Woodruff's Greek Prose Composition.)

3. Homer: *First Semester*, daily at 9. (Merry's Odyssey XIII-XXIV, Autenrieth's Homeric Dictionary, Jebb's Introduction to Homer.)

4. Demosthenes: *Second Semester*, daily at 9 and one extra hour. (Demosthenes Philippics and Olynthiacs, Goodwin's Greek Moods and Tenses, Jevon's Greek Literature.)

5. Greek Tragedy: *First Semester*, Tuesday, Thursday, Saturday, at 12. Plays of Æschylus, Sophocles or Euripides will be read, and study made of the Greek theatre.

6. Greek Comedy: *Second Semester*, Tuesday, Thursday, Saturday, at 12. Study of comic presentation and reading of plays of Aristophanes.

Courses 1 and 2 (Freshman), 3 and 4 (Sophomore), 5 and 6 (Junior), are required for the A. B. degree; Courses 7 and 8 (Junior) are required for the L. B. degree.

ELECTIVE COURSES.

7. Private Life of the Greeks. *First Semester*, Tuesday, Thursday, Saturday at 11. Prof. MANLY. Lectures illustrated by maps, charts and stereopticon views.

8. Public Life of the Greeks. *Second Semester*, Wednesday, Thursday, Friday at 11. Prof. MANLY. Lectures illustrated by maps, charts and stereopticon views.

9. The Idylls of Theocritus. *Second Semester*, two hours a week. Prof. MILLER. Lectures and recitations. Hours to be arranged with the instructor.

10. Teachers' Course. Two semesters, one hour a week. Prof. MANLY. This course will be conducted on the normal plan, and special attention will be given to methods of teaching preparatory Greek. Hour to be arranged with instructor.

11. New Testament. One semester, two hours a week. Prof. MANLY. Selections from the New Testament will be read and compared with Attic Greek. Hours to be arranged with instructor.

12. Reading at Sight. Two hours a week to count as one. Prof. MANLY. Hours to be arranged with instructor.

13. Lectures on the History of Greek Sculpture. Three hours a week, both semesters. Prof. MILLER.

14. Historical Development of Greek Architecture. Two hours a week, *first semester*. Prof. MILLER.

Preparatory Course. Two semesters daily at 9. This course is intended for students not prepared to enter the Freshman Class.

J. W. White's "Beginners' Greek Book," Xenophon's Anabasis, Goodwin's Greek Grammar, Cox's History of Greece, Kiepert's or Ginn's Classical Atlas.

Enrollment for 1891-92, 100.

IV. Department of Modern Languages.

Professor BLACKWELL—Assistant-Professor HOFFMAN.

Tutors—R. F. BRYAN, G. L. BROWN, H. J. GERLING.

Besides the study of several grammars, classes in German in 1891-92 practiced composition, received lectures on German literature, and read Schiller's "Maria Stuart," "der gefrorene Kuss," Lessing's "Minna von Barnhelm," Goethe's "Egmont," Faust, Pt. I, part of "Wahrheit und Dichtung," and Lessing's "Laokoon." Classes in French read Feuillet's "Roman d'un Jeune Homme Pauvre," Merimee's "Colomba," Souvestre's "Philosophe sous les Toits," Victor Hugo's "Hernani" and "Ruy Blas," Moliere's "Bourgeois Gentilhomme," Lyrical Selections from Lamartine, Beranger and other poets, DeMusset's "On ne badine pas avec l'Amour" and "Fantasio," and Gautier's "Voyage in Espagne," grammar and composition.

Courses of instruction are outlined as follows:

GERMAN.

1. Whitney's Brief German Grammar, Elementary Reader.
 2. Whitney's Revised Grammar; Reader completed; Blackwell's Manual of Prefixes and Suffixes, weekly recitations.
 3. Grammar, weekly recitations; Literary and Scientific Prose Readings; Manual completed; Studies in Synonyms.
 4. Prose composition daily; Heine's "Harzreise," "Goetz von Berlichingen;" Study of Style; lectures on Language and Literature weekly.
- Classes recite three times a week.

ELECTIVE COURSES IN GERMAN.

5. Egmont; Study of the Drama; The Laokoon.
 6. Nathan der Weise; Themes; Schiller's Tell.
 7. Faust: Themes.
 8. Studies in Herder, Richter and Schiller; General Review.
- Composition throughout the elective courses.
- Equivalent work to the above courses will receive acknowledgment.
- All elective studies to be timed at the convenience of the professor and students.
- The Post-graduate course will embrace studies in Middle High German (Paul's "Mittel-hochdeutsche Grammatik, der arme Heinrich, the Nibelungenlied"), Old High German, and Comparative Teutonic Philology.

FRENCH.

1. Whitney's Brief Grammar and Reader.
 2. Grammar and Reader completed; "Tableaux de la Revolution Francaise;" Composition.
 3. "Le Roman d'un Jeune Homme Pauvre," by Octave Feuillet; "Le Romantisme Francaise;" Composition.
 4. Composition; Study of Synonyms; De Musset; Moliere's "Bourgeois Gentilhomme;" Lectures on the Language and Literature.
- Classes meet three times a week.

ELECTIVE COURSES.

5. "Eugenie Grandet," by Balzac; Selections from Moliere; Study of Style; Themes.

6. "Numa Roumestan," by Daudet, selections; Lamartine's Poems, selections; "Ruy Blas," by Victor Hugo; Study of Prosody; Themes.

7. Selections from "Les Miserables" of Victor Hugo; "Les Trois Mousquetaires," by A. Dumas; Themes.

8. Studies in Racine and Corneille, and the Drama; General Review of the work.

Composition throughout the elective courses.

Equivalent work will receive acknowledgment.

All elective studies to be timed at the convenience of the professors and students.

Post-graduate studies embrace work in Old French, the "Langue d'Oïl," Provencal (Bartsch, Burguy, Kitchin), and Romance Philology (Diez, Meyer, French editions of both preferred).

ELECTIVE STUDIES.

SPANISH.

1. Manning's Grammar and "Lecturas de Clase," by Knapp.

2. Grammar continued, Knapp's Readings.

3. Gaspar's "Castigo de Dios," Selections from Don Quixote.

4. Lope de Vega's "Dorotea," selections from the Cancioneros, History of Spanish Literature (Ticknor).

Post-graduate studies will include studies of Calderon, "Garcilasso de la Vega," and attention to Catalanian and Valencian Literature.

These studies at the time and convenience of the professor.

A class was formed in 1891-92, and continued throughout the year.

ITALIAN.

1. Grandgent's Grammar, Easy Readings.

2. "Il Marco di Visconte," Fanfani's Synonyms.

3. Calogero's "Novelle Calesbresi," Tasso's "Girusalemme Liberata," four cantos.

4. The Prince of Machiavelli, selections from the Purgatorio of Dante, history of the Literature.

Post-graduate studies will include studies in Ariosto, Petrarch (Le Rime and Le Lettere, especially), Dante, and modern poets.

These studies at the time and convenience of the professor.

A class pursued this work in 1891-92.

PORTUGUESE.

1. Cabano's Grammar, Historio do Brazil (Ginn).

Four semesters in Spanish, or Italian or French, necessary for entrance.

At the time and convenience of the professor.

No class in this work in 1891-92.

RUSSIAN.

1. Reiff's Grammar, Riola's Reader.

2. Reiff and Riola continued, Vogue's "Russkiye Pisateli."

3. Selections from Tolstoi's "Voina i Mir."

Candidates must have had four semesters in German, or Latin, or Greek.

At the time and convenience of the professor.

Course offered in 1891-92, and applied for by two students, one of whom has learned to read the language.

Enrollment of students in German and French, 250; in Spanish and Italian, 18.

V. Department of Semitic Languages.

Professor BLACKWELL.

There was one class in Hebrew in 1891-92, and it continued the work through the year, reading in Genesis.

HEBREW.

1. Harper's Method and Manual.
2. Harper's Elements, Books of Ruth and Esther.
3. Harper's Syntax, The Psalms, Driver's Tenses, Ancient History.
4. Study of Isaiah (Alexander, Cheyne and Delitzsch), Wicke's Accent.

Post-graduate studies will include post-biblical literature, the Pirke Aboth from the Mishna (Taylor), and the Pentateuchal Question.

(Delitzsch, Dillman, Wellhausen, Kuenen, Bissell, Harman, Harper, Green and others.)

ARAMAIC.

1. Brown's Grammar and Reader.
2. The Targums.

Two semesters of Hebrew are necessary for entrance.

No class in 1891-92.

SYRIAC.

1. Nestle's Grammatik and Chrestomathie.
2. Bagster's Peshitto New Testament and Lexicon.

Two semesters in Hebrew necessary for entrance.

No class in 1891-92.

ARABIC.

1. Lansing's Grammar and Chrestomathy.
2. Wright's Reading Lessons, Wortabet's Dictionary, first two surahs of the Koran.

Two semesters of Hebrew necessary for entrance.

No class in 1891-92.

VI. Department of Sanskrit.

Professor BLACKWELL.

1. Perry's Sanskrit Primer, Whitney's Grammar.
 2. Story of Nala, Hitopadeca, Dharmacastra.
 3. Hymns to Agni and Varuna, and the Funeral Hymns of the Rigveda, Brahmanas.
- Three students enrolled in 1891-92.

VII. Department of Comparative Philology.

Professor _____.

VIII. Department of Political Science.

FREDERICK C. HICKS, Professor.

First Semester—

1. History of England. Text-book. Wednesday, Friday, 3 p. m.
3. Ancient and Modern Governments. Text-book. Wednesday, Friday, 2 p. m.
5. Political Philosophy. Lectures. Tuesday, Thursday, Saturday, 2 p. m.
7. Problems in Economics (Social). Lectures and Topics. Tuesday, Thursday, Saturday, 3 p. m. Course 7 must be preceded by Course 6.
9. Theory of Jurisprudence. Lectures. Wednesday, Friday, 4 p. m. Course 9 must be accompanied or preceded by Course 5.
11. Seminary in History. Topics. Thursday, Saturday, 4 p. m. Course 11 must be preceded by Course 5 and one other course in Political Science.

Second Semester—

2. History of the United States (Political). Text-book. Tuesday, Thursday, Saturday, 3 p. m.
4. Political Institutions of the United States. Text-book. Wednesday, Friday, 3 p. m.
6. Theory of Economics. Lectures. Tuesday, Thursday, Saturday, 12 m. Course 6 must be preceded by Course 5.
8. Problems in Economics (Industrial). Lectures and Topics. Tuesday, Thursday, Saturday, 2 p. m. Course 8 must be accompanied or preceded by Course 6.
10. Theory of Finance. Lectures. Wednesday, Friday, 12 m. Course 10 must be preceded by Course 5.
12. Seminary in Economics. Topics. Wednesday, Friday, 2 p. m. Course 12 must be preceded by Course 7 or 8.
13. Constitutional and International Law. Hours to be arranged. Open only to Seniors who have taken Course 9.

REQUIRED WORK.

COURSE 1—History of England is required of students in the L. B. and S. B. courses during the first semester of the Sophomore year.

COURSE 2—History of the United States is required of students in the L. B. course during the second semester of the Sophomore year.

COURSE 3—Ancient and Modern Governments is required of students in the A. B. and L. B. courses during the first semester of the Sophomore year.

COURSE 5—Political Philosophy is required of students in the L. B. course during the first semester of the Junior year.

COURSE 6—Theory of Economics is required of students in the L. B. course during the second semester of the Junior year.

IX. Department of Mental and Moral Philosophy.

Professor BLANTON.

First Semester—

Psychology. Recitations and Lectures. Text-book: Murray's Hand book.

Second Semester—

Logic. Recitations and Lectures. Text book: Jevons.

Ethics. Recitations and Lectures. Text-book: Murray.

A course of reading in the history of philosophy will be required.

X. Department of Mathematics and Astronomy.

W. B. SMITH, Professor. W. C. TINDALL, Associate Professor.

MILTON UPDEGRAFF, Assistant Professor and Director of Observatory.

(Arabic numerals in parenthesis indicate the enrollment for 1891-92.)

The following courses are offered:

1 and 2. Solid Geometry, Plane and Spherical Trigonometry. Thrice weekly, both semesters, Freshman.—UPDEGRAFF. (71)

Texts: Hayward's solid Geometry, Smith's Clew to Trigonometry.

3 and 4. Advanced Algebra. Twice weekly, both semesters, Freshman.—TINDALL. (33)

Text: Smith's Treatise on Algebra, from Chapter XIX.

5 and 6. Co-ordinate Geometry and Determinants. Thrice weekly, *first semester*; four times weekly, *second semester*, Sophomore.—SMITH or TINDALL. (42, 22)

Texts: Smith's Co-ordinate Geometry, Muir's Determinants.

7 and 8. General Astronomy. Thrice weekly, both semesters, Junior.—UPDEGRAFF (13)

Text: Young's General Astronomy.

Of the foregoing courses there are prescribed 1, 2 and 3 for the degrees of A. B. and L. B., and all but 7 for the degree of S. B.

ELECTIVES.

9 and 10. Infinitesimal Calculus (Double Course). Six times weekly, both semesters, Junior.—SMITH or TINDALL. (9)

Text: Greenhill's Calculus.

11 and 12. Higher Algebra. Theory of Equations and Quantics. Thrice weekly, both semesters, Junior.—TINDALL. (5)

Text: Burnside & Panton's Theory etc.

13 and 14. Solid Co-ordinate Geometry.—Thrice weekly, both semesters, Senior.—SMITH or TINDALL. (3)

Text: Frost's Solid Geometry.

15 and 16. Differential Equations.—Four times weekly, both semesters, Senior and Post graduate —SMITH. (5)

Text: Forsyth's Differential Equations.

17 and 18. Functions of Complex Argument, in particular Doubly Periodic Functions.—Four times weekly, both semesters, Post graduate.—SMITH. (4)

Text: Halphen's *Traite*, supplemented from Hermite and Weierstrass.

19. Mathematical Seminary (for orientation in various mathematical disciplines and for incitement to original research).—Twice weekly, first semester, Junior and Senior.—SMITH.

20. History of Mathematics.—Twice weekly, second semester, Junior and Senior.—SMITH.

21 and 22. Practical Astronomy.—Thrice weekly, both semesters, Junior.—UPDEGRAFF. (21 is required for the degree of C. E. and is open to students that have passed in Trigonometry.) (4)

Text: Greene's Spherical and Practical Astronomy.

22 presupposes one semester's Calculus (9) and is elective.

23 and 24. Practical Astronomy.—Four times weekly, both semesters, Senior.—UPDEGRAFF. (1)

25. Least Squares.—Thrice weekly, second semester, Junior. Required for the degree of C. E.—UPDEGRAFF. (2)

Text: Merriman's Least Squares.

26 and 27. Rest and Motion.—Four times weekly, both semesters, Post-graduate.—SMITH. (2)

Text: Budde's *Allgemeine Mechanik*.

Courses 11 and 12 are continuations of 3 and 4; Courses 13 and 14 of 5 and 6; Courses 9 and 10 are continued in 15 and 16, which may themselves be extended on demand into the Theories of Linear and Partial Differential Equations; and the series is especially recommended to students of Engineering. Courses 15-20 are designed for teachers and special students of Mathematics

The general condition of admission to any course is knowledge presumably adequate to profitable pursuit of the subject in hand. For admission to the Freshman classes there is required the equivalent of the Preparatory Courses outlined below, and examination for such admission will be based upon the texts there mentioned, viz.: Smith's Elementary Algebra, Smith's Treatise on Algebra (to chapter XIX), and Smith's Modern Geometry—all published by Macmillan & Co.

PREPARATORY COURSES.

These extend through two years, as follows:

Ia. Elementary Algebra (Smith's, 1-240), thrice weekly, both semesters. (165)

Ib. Elementary Geometry (Smith's Modern Geometry, to Areas), twice weekly, both semesters. (191)

IIa. Mediate Algebra (Smith's Elementary completed, Smith's Treatise, selections, to chapter XIX, p. 273), thrice weekly, both semesters. (108)

IIb. Mediate Geometry (Smith's Modern Geometry, completed), twice weekly, both semesters. (93)

Candidates for admission to any of these courses must pass a satisfactory examination on Arithmetic, through percentage. The classes are taught by instructors chosen with careful regard to mathematical attainment and aptitude for teaching.

Total enrollment of individuals, 394.

THE OBSERVATORY.

MILTON UPDEGRAFF, Director.

The Observatory is pleasantly situated on the campus, and is equipped with the following instruments:

(1) A $7\frac{1}{2}$ -inch refracting Equatorial Telescope, by MERZ UND MAHLER, of Munich, furnished with a driving clock, position filar micrometer, two spectroscopes, by Fauth & Co., eye-pieces and adapters.

(2) A $2\frac{1}{8}$ -inch Transit Instrument, by BRUNNER, of Paris, with a divided circle in declination read by two verniers to 3 seconds of arc.

(3) An Altitude and Azimuth Instrument, by BLUNT, of New York, aperture 2 inches, and also a Sextant by the same maker.

(4) A Sidereal Clock by FAUTH & Co., of Washington, a Mean Time Clock by GREGG & RUPP, of New York, and a Sidereal Break-circuit Chronometer, by WM. BOND & SON, of Boston.

(5) A Chronograph, by FAUTH & Co., Theodolite, by GREGG & RUPP, 20-inch Celestial Globe, Barometer and Thermometers, by H. J. GREEN, of New York, electrical apparatus, and other smaller instruments.

The clocks and instruments are connected with each other by means of insulated copper wire for the transmission of electric signals, and a double line of telegraph wire connects the Observatory with the Western Union Telegraph office in Columbia for the transmission of time signals. Both clocks and instruments are mounted on piers of solid masonry, isolated from the floors and walls of the building. The dome of the equatorial telescope is $17\frac{1}{2}$ feet in diameter, and is made of wood covered with sheet-iron. It is supported by an octagonal brick tower at the east end of the building, and revolves on wheels that run on a cast-iron track. The telescope is mounted on a wooden stand which rests on a brick pier. A portion of the west end of the building is surmounted by a cone 14 feet in diameter, which revolves on cannon balls and shelters the altitude and azimuth instrument. The transit room has three slits in the walls and roof for observation, and contains the transit instrument, chronograph and sidereal clock. An office 15×18 and a library room 15×12 with basement 15×30 have been recently erected adjoining the west end of the Observatory building.

The course in Practical Astronomy comprises instruction in the theory of instruments, in the solution of the more important problems of Spherical Astronomy, in the use of portable instruments for the determination of Time, Latitude, Longitude and Azimuth, and also in the computation of predictions of eclipses of the sun and moon and transits of the inferior planets. Whenever possible, observations of these phenomena are made by the student, under the supervision of the professor, and thus the accuracy of both computation and observation is tested. When sufficiently advanced, students may undertake a series of micrometric observations with the equatorial telescope, and also the mathematical calculations involved in the reduction of the same. Instruction in the determination of the orbits of comets and planets will be given to students who are fitted to undertake this class of work.

XI. Department of Physics.

JOSEPH G. NORWOOD, Professor Emeritus. MILLARD L. LIPSCOMB, Professor. WILLIAM SHRADER, Assistant Professor.

The instruction in Physics consists of recitations, lectures, lecture-room experiments and laboratory work, and comprises the following courses:

1. Recitations and lectures three times per week during the first semester of the second preparatory year, attended by all students, in which the whole subject of physics is discussed in an elementary manner and fully illustrated by experiments.

2. Recitations and lectures four times per week in the second semester of the Sophomore year. Subjects: Mechanics, Hydrostatics, Pneumatics and Electricity and Magnetism. Requisite for admission, grades in all mathematics up to the first semester of the Sophomore year. Required in the Scientific and Engineering Courses, elective in the A. B. and L. B. Courses.

3. Recitations and lectures twice per week. Subject: Sound and Light. Requisite for admission, same as in Course 2. Required in Scientific and Engineering Courses, elective in A. B. and L. B. Courses.

4. Laboratory. Two hours a week through the first semester of the Junior year. Requisite for admission, a grade in Course 3. Required in the Scientific and Engineering Courses, elective in the A. B. and L. B. Courses.

5. Recitations and lectures. Subject: Heat. Requisite for admission, same as Course 2. Required in Scientific and Engineering Courses, elective in A. B. and L. B. Courses.

6. Laboratory. Four times a week through the second semester of the Junior year. For courses in Physics in the Engineering Courses, see Engineering.

ELECTIVES.

To students in the A. B. and L. B. courses is offered the Physics laid down in the Sophomore and Junior years of the Scientific course.

To all Academic students the following courses are offered:

JUNIOR.

7. Laboratory. Two hours a week, first semester

8. Special instruction in the construction and manipulation of apparatus for lecture table experiments. This course is especially intended for teachers. Three hours a week, first semester.

9. Electricity and Magnetism. Four hours a week, second semester.

SENIOR.

10. Mechanics. Four hours a week, first semester.

11. Laboratory. One hour a week, first semester.

12. Mechanical Theory of Heat (Clausius) or Thermodynamics. Five hours a week, second semester.

13. Special Laboratory work.

LABORATORY.

In addition to the instruction received in common with the other classes, the students in the scientific and engineering courses are required to take two hours per week during the first semester of the Junior year, and four hours per week during the second semester of the Junior year, in the Physical Laboratory.

The work consists of precise weighings, determinations of densities, verification of the laws of elasticity and capillarity, determinations of the intensity of gravity, barometric readings and reductions, magnetic declination and inclination, horizontal intensity of the earth's magnetism, variation of magnetic intensity, magnetic moment, temperature co-efficient of magnets, measurement of resistance of conductors and batteries, electro-motive forces, potentials, capacities, strength of currents, calibration of rheostats, verification of the laws of sound and radiant heat, determinations of specific and latent heats, expansions and vapor densities, radii of curvature of lenses and mirrors, focal lengths, wave lengths, indices of refraction, angles of crystals and verification of the laws of diffraction and interference.

The students study spectrum analysis, learn the use of the microscope, and in polarized light determine the rotation of the plane of polarization, percentage of sugar in solutions by means of saccharimeter, experiment with double refracting bodies, distinguish between positive and negative crystals, determine angle of optical axes of crystals, etc.

Advanced laboratory work and reading courses in Physics will be given to suit the individual needs of special students.

PHYSICAL APPARATUS.

The instrumental equipment of the Department of Physics was almost entirely destroyed by the fire of January 9, 1892, but is being rapidly replaced, and will consist of apparatus especially selected for accurate measurements, principally from the following renowned makers: Queen, Ritchie, Becker and Green of this country; Browning, Patterson and Cooper, and Elliott Bros., London; Hartmann and Braun, and Edelmann, Germany; Duboscq, Demeritens and Breguet, and Koenig, Paris; Societe Genevoise, Geneva.

A fee of five dollars per semester is charged for laboratory instruction.

Text-books and Books of Reference—Deschanel's Natural Philosophy; Ganot's Physics; Maxwell's Theory of Heat; Thompson's Lessons in Electricity; Daniell's Principles of Physics; Glazebrook and Shaw's Practical Physics; Kohlrausch's Physical Measurements; Pickering's Physical Manipulations; Trowbridge's New Physics; Stewart and Gee's Practical Physics; Everett's Physical Constants; Kempe's Hand-book of Electrical Testing; Ayrton's Practical Electricity; Thompson's Dynamo-Electric Machinery; Kapp's Transmission of Electrical Energy; Gray's Absolute Measurement; Maxwell's Electricity and Magnetism; Wiedemann's Elektrizitat; Houston's Dictionary of Electrical Terms, Phrases, etc.; Mascart and Joubert's Electricity and Magnetism; Watson and Burbury's Mathematical Electricity and Magnetism; Stokes' Mathematical and Physical Papers; Ball's Experimental Mechanics; Goodeve's Principles of Mechanics; Rayleigh's Theory of Sound; Gore's Electro-Metallurgy; Schellen's Spectralanalyse; Pope's Telegraphy; Fiske's Electrical Engineering; Preece and Maier's Telephone; Cumming's Theory of Electricity.

THE PHYSICAL SEMINAR.

The object of this society is to develop general scientific culture, and at the same time to keep abreast with the current work and thought in special branches of science and engineering.

Meetings are held once a month, at which papers are read, giving a review of the current scientific and engineering periodicals, with explanation and discussion of the most important articles. Special historical sketches are also read from time to time. The attendance at and participation in these meetings is voluntary, but judging from the interest manifested by the students during the past year, this society is doing a useful work.

Enrollment of students, 1891-92, 280.

XII. Department of Chemistry.

Professor SCHWEITZER.

FREDERICK HOMBURG, Assistant Professor.

SILAS DINSMOOR, Assistant.

I. ARRANGEMENT OF CLASSES BY SEMESTERS.

First Semester—

- 11-12 (4 hours). Phenomenal Chemistry.
 4 hours Laboratory work, divided according to plan into
 3 hours Young Chemist,
 5 hours Qualitative Analysis.

ELECTIVES.

- 3 hours Applied Chemistry.
 3 hours Organic Chemistry.
 3 hours Quantitative Analysis.

Second Semester—

- 11-12 (4 hours). Phenomenal Chemistry.
 4 hours Laboratory work, divided according to plan into
 3 hours Young Chemist.
 5 hours Qualitative Analysis.
 10-11 (3 hours). Rational Chemistry.

ELECTIVES.

- 3 hours Agricultural Chemistry.
 3 hours Physiological Chemistry and Toxicology.
 3 hours Quantitative Analysis.

II. SYNOPSIS OF WORK.

1. *Phenomenal Chemistry*, 4 hours, an elementary course of instruction, consisting in experimental demonstrations of the facts of the science, and embracing both the metalloids and the more common of the metals; calculations of quantities by weight and volume, of changes in the volume of gases by changes of temperature and pressure, writing of reactions and establishing of formulas upon proper physical facts, accompany the work. (Ira Remsen: An introduction to the study of chemistry.)

2. *Chemical Laboratory*, 8 hours, divided as indicated above between work in which the use of apparatus and the art of making experiments are taught—the experiments being simple and illustrative of the properties of the more common of the elements and their compounds (Appleton: *The Young Chemist*); and practice in qualitative analysis, separating and detecting all of the more common bases and acids in simple compounds and in complex mixtures. (Curtman: *Lessons in qualitative and volumetric chemical analysis*.)

3. *Rational Chemistry*, 3 hours; the principles of Chemical Philosophy, with a review of inorganic chemistry. (Cooke: *Principles of Chemical Philosophy*, Part I.)

ELECTIVES.

4. *Applied Chemistry*, 3 hours; *Air*, respiration, vitiated air and ventilation; infection, contagion, germ theory of disease. *Water*, potable water, hard and soft; impurities in it, such as lead and sewage matter, and their effects upon health and life; mineral and other waters. *Food*, composition and general properties; *bread, meat, milk, sugar*; preservation of food, and food adulterations. *Illuminants, Disinfectants, Antiseptics*.

5. *Organic Chemistry*, 3 hours; a general view of subject; detailed treatment of monatomic alcohols, acids and derivatives; aromatic compounds; compound ammonias, alkaloids. (Ira Remsen: An introduction to the study of the compounds of carbon.

6. *Agricultural Chemistry*, 3 hours; general introduction; functions of the plant, including production, conversion, transportation, deposition of organic matter; physiological structure of the cell; respiration; the green cell an apparatus for doing work dependent upon light and heat; nitrogenous constituents of the plant and their relation to free and combined nitrogen; mineral constituents; membranous diffusion; assimilation; conditions of vegetation.

Soil, its formation, composition, alteration by mechanical, chemical, biological agencies; its relation to light, heat and moisture.

Manures, natural and artificial; their composition, application, value.

7. *Physiological Chemistry and Toxicology*, 3 hours; general introduction; constituents of the body; inorganic, histogenic and products of retrogressive metamorphosis; blood and related fluids; milk and other secretions; urine, healthy and pathological.

Poisons, their classification, description, recognition; action of poisons; their detection and isolation in judicial investigations.

8. *Laboratory work*, twice 3 hours; quantitative analysis, as may be determined upon.

Number of students in this department during the scholastic year just ending, 344.

XIII. Department of Geology and Mineralogy.

Professor BROADHEAD; W. W. CLENDENIN, Assistant Professor; M. H. LOCKWOOD, Assistant.

MINERALOGY AND LITHOLOGY.

Students in Science and Engineering courses are required to take the course in Mineralogy and Lithology. The time occupied may be found in the schedule. One afternoon each week is devoted to Laboratory work.

Students in Arts and Letters may elect the course in Mineralogy.

In Physical Mineralogy, students will also receive instruction in Crystallography, including the measuring of angles of crystals, their physical characters, such as H., Sp. Grav., polarized light, etc.

In the study of minerals the most important will be considered, including the rock-making species (*a*), chief ores (*b*), the gems (*c*), and those of economic value (*d*).

The course of Lithology embraces the study of the composition, structure and origin of the most important rocks.

To students who elect special work in Mineralogy and Lithology will be furnished facilities for work in Mathematical Crystallography and optical investigations of minerals; also a systematic and comprehensive course in Mineralogy.

Fees to cover use of apparatus and material will be charged.

For admission into class in Mineralogy students must have taken a Course in Chemistry.

PHYSICAL AND ECONOMIC GEOLOGY AND MINERALOGY.

Instruction in this course will be given to the Agricultural and Engineering Students. The instruction will be chiefly by lectures upon Economic Geology and Mineralogy, Lithology, Physical Geography and Geological Surveying, embracing the study of build-

ing materials, decomposition of rocks and production of soil; useful minerals, their occurrence in veins and beds, coal deposits, useful mineral substances, and surface Geology and its application to Engineering and Agriculture.

Text-book: Williams' Applied Geology.

The rich mineral resources of Missouri will be freely discussed, and its Geology often referred to.

Advanced students in Geology will devote a large portion of their time to the study of Palæontology and the determination of fossils, with occasional practice in Field Geology. The course in Palæontology will be mainly by lectures and the study of fossils.

To students who elect a special course, opportunity for field work will be given during both semesters.

Students in Geology are expected to have previously studied Physical Geography, Zoology and Chemistry. The course in Physical Geography is quite thorough.

Text-book: Appleton's Physical Geography.

Text-book for Geology: Le Conte's Elements.

Text-book for Mineralogy: Dana. Books of reference, Dana's Geology.

The Geology of Missouri will be often discussed and its structure fully explained.

Books of reference: Missouri State Geological Reports.

ELECTIVE COURSES.

Full opportunity will be given students to continue the course in Mineralogy for an additional semester, or longer, if so desired. This will include—

- A. 1. Physical Mineralogy, Crystallography and Physical Properties of Minerals.
2. Laboratory work relating to the above.
- B. Descriptive and Determinative Mineralogy, with Laboratory work.
- C. Lithology, with such Laboratory work as we are prepared for.
- D. Discussion of Ores, Mines and Mining.

To students who have already taken a semester's work in Mineralogy, the Elective course will consist of studies of additional minerals. As far as practicable they can add microscopical, as well as macroscopical, studies of both minerals and rocks.

The following is a general statement of the character of the regular course, as well as the

ELECTIVE COURSE IN GEOLOGY.

Students in Arts and Letters may elect the course in Geology. Full opportunity will be given students to continue the course in Geology and Palæontology for an additional session, and to take also additional field work.

First Semester:

Physiographic and Lithologic Geology (one week).

Dynamical and Structural Geology.

Occasional Geologic excursions.

Applied (Economic) Geology.

Missouri Ores.

Study of Fossils.

Second Semester:

Historic Geology and Palæontology, with Laboratory and Field work.

The course in Geology includes the form and features of the earth, its physical changes due to atmospheric agents and to temperature, trend of mountain ranges, erosion and transportation of sediments.

Lithological Geology—Definition of minerals and rocks, classification of rocks.

Dynamical Geology—Glaciers, drift, chemical agents, formation of caves, deposits in springs, salt lakes, alkaline lakes, organic agencies, formations of peat, coal, iron ore, coral reefs; volcanoes, earthquakes, elevation and depression of earth's surface, mountain making.

Structural Geology—General form of the earth, its crust, continental form, stratified rocks, how formed, how changed; folds, faults, dip, cleavage, etc.; structures common to all rocks, mineral veins, metamorphism, igneous rocks.

Economic Geology—Substances used in the arts, building stones, limes, clays, fuels, minerals, ores.

Classification of soils—how formed and reclaimed; fertilizers; water supply; Missouri ores described, their occurrence, distribution; related minerals and value.

HISTORIC GEOLOGY AND PALÆONTOLOGY.

Classification of strata and their distribution, as related to Missouri; use of fossils and how formed; description of chief palæozoic forms of life, their advent, culmination, decline or extinction; carboniferous flora and formation of coal, and area of coal fields; animal life of each age; age of various mountain systems, how and when formed; Appalachian, Alpine, Ozark uplift.

Geological excursions when practicable.

Students who have already taken the S. B. course in Geology may supplement their work by additional studies in Historic Geology and Palæontology, including a determination of characteristic fossils; the formation and relative age of the various mountain systems; the whole supplemented by Lectures on Economic and Areal Geology.

Total number of students in the Department for 1891-92, 101.

XIV. Department of Biology.

GEO. D. PURINTON, Professor; W. R. DODSON, Assistant Professor.

The School of Biology includes—A, Botany, and B, Zoology.

A. BOTANY.

All students in the Preparatory Department are required to take Elementary Botany, and it is a requisite for admission from approved schools.

The Elementary Course includes a study of the fundamental principles of Vegetable Morphology, Plant Nutrition and Physiology, and introductory Plant Analysis.

The object of the course is to fit the student for the higher work in Botany, and to meet the requirements of the Normal Course in Biology as at present constituted in the University.

Text-books: Gray's School and Field Book of Botany, Purinton's Plant Analysis.

All students in the Scientific Course are required to take an advanced course in Botany during the spring term of the Freshman year. This course is also open to classical and literary students who may elect Science. Elective courses in Botany are also offered as shown in the appended table of elective studies.

B. ZOOLOGY.

Preparatory students, whether at the University or in the approved schools, are required to take one term in Elementary Zoology, accompanied by simple dissections in the Laboratory.

The Advanced Course for Scientific students begins with the commencement of the Freshman year and continues for one term, and is open alike to Classical and Literary students.

The course consists of lectures on Comparative Anatomy and Physiology, Histology, Embryology, the Mental Traits and Habits of the Lower Animals, and the Natural History of Man.

The course is accompanied by Laboratory practice with the microscope.

THE BIOLOGICAL LABORATORY.

The Biological Laboratory is supplied with Bausch and Lomb, Crouch, and Nachet microscopes, hand microtomes, a large and superior Thoma microtome, turn-tables, and various accessories for the critical histological study of vegetable tissues.

Science students are required to spend three afternoons of each week during the fall term of the Sophomore year in the Biological Laboratory, and the same course is open to students in the Classical and Literary Courses. The course includes a study of the minute anatomy of common phænerogams, and such ordinary cryptogams as are obtainable, and the microscopic fungi (rusts, smuts, moulds, and plant diseases in general).

For Medical students there is a course in Botany, embracing lectures in Plant Physiology and Nutrition, for three days in each week, extending through the fall term.

A course in Economic Botany for Engineering students is given upon two days in the week in the spring term.

A short two months' teachers' course in Botany and Zoology is given during the months of April and May.

ELECTIVES IN BIOLOGY.

Year.....	Course....	Term...	BOTANY.	Hours per week...	Year....	Course...	Term....	ZOOLOGY.	Hours per week...
Junior.	A B	2	Cryptogamic Botany, or Bacteriology.....	3	Junior.	A B	1	Embryology	3
	B L	2	Cryptogamic Botany, or Bacteriology.....	3		L B	1	Embryology	3
	B S	2	Cryptogamic Botany, or Bacteriology.....	3		B S	1	Embryology	3
Senior.	A B	2	Economic Botany, or Vegetable Histology.....	3	Senior.	A B	1	Histology.....	3
	B L	2	Economic Botany, or Vegetable Histology.....	3		L B	1	Histology.....	3
	B S	2	Economic Botany, or Vegetable Histology.....	3		B S	1	Histology.....	3

Number of students in Biology during the year, 245; number of elective students in Biology during the year, 14.

THE MUSEUM.

Prof. PURINTON, Director and Curator.

Many of the most valuable collections of the old Museum were saved from the fire, others will be added, and in the immediate future a new and well-appointed Museum will be equipped.

THE NEW BUILDING.

The erection of a new and commodious building for the combined uses of the departments of Biology, Geology and the Museum has been ordered by the Board of Curators, and the work of building will be pushed with all possible dispatch, so that it is safe to anticipate its completion early in the coming year.

FEES AND DEPOSITS.

All students in advanced Zoology are required to pay a fee of \$2 for laboratory supplies, and make a deposit of \$8, to be returned, less breakage and damage, at the end of the year.

Elementary students in Zoology pay a fee of \$1, and students in the Biological Laboratory, \$3 per term.

YOUNG WOMEN.

Mrs. J. P. ROYALL in charge.

It is now twenty years since the University was opened alike to both sexes. The number of young women matriculating has increased steadily from year to year, and now exceeds one hundred. In this University, as in so many others, co-education has thoroughly approved itself, and is now passed quite beyond the stage of experiment. Large liberty is allowed in the selection of studies, but the same demands are met by all members of the same class, and the young women often distinguish themselves in the severest subjects. The lady in charge, whose chief duty it is to chaperone her wards, extends to them at all times the friendliest counsel and sympathy, and every other provision is made for their health, comfort, convenience and improvement. While no such educational advantages for young women are to be found outside of a University, the expense is even less than at ordinary schools for girls.

DRESS.

A simple uniform, becoming to all young women, is particularly desirable for students, as it not only economizes time, money and attention, but also identifies them, outwardly, with the University, while at the same time it abolishes in a measure the distinction of rich and poor. Accordingly the following has been adopted as the attire of matriculates for every day, regular and special holidays excepted:

A walking suit of black cloth with black trimmings. During the first month of the first semester and the last month of the second semester, a white basque or waist may be worn instead of a black one. The hat must be black, but its shape and material are left at discretion, except that ornamental trimmings, such as flowers and feathers, are forbidden. The rule of the Faculty, authorized by the Board of Curators, prescribing this uniform, is enforced by a penalty of ten demerits for each day's violation of it.

LITERARY SOCIETIES.

Of these, there are two, the Philalethean and the Thalian. Both have large membership, and afford the young women ample opportunity for culture in forms of discipline, such as the composition and presentation of addresses, orations, essays not especially provided for in the ordinary curricula, and of these opportunities they have not been slow to avail themselves.

In the new University buildings there will be made the most complete and perfect provision of society and study halls and other apartments for the young women.

A Young Woman's Christian Association recently organized with a large active and associate membership is doing an earnest and zealous work, sure to be crowned with beneficent results. All the professional departments of the University are open to young women.

SCHEME OF ACADEMIC STUDIES.

On the opposite page will be seen the scheme of Academic studies, divided into three groups or courses:

The Classical, leading to the degree of A. B.; the Literary, to the degree of L. B.; the Scientific, to the degree of S. B.

A slight examination will show that in the Classical course Latin and Greek predominate; in the Literary course, English and Modern Languages; in the Scientific course, Mathematics and the Sciences.

On reaching the Junior year, the candidate for a degree may choose such special lines of work as he finds suited to his taste and need. In the choice of electives, however, certain rules are laid down for his guidance.

REGULATIONS CONCERNING ELECTIVES.

1. In the Junior and Senior years, students in the classical or A. B. course *must* elect *twelve hours*—that is, three hours each semester—from the electives offered in Latin or in Greek, or Roman or Greek History, or Comparative Philology; those in the Literary or L. B. course *must* elect *twelve hours*—that is, three hours each semester—from the electives offered in English (Language or Literature), French, German, or History (Mediæval or Modern), or Political Science; those in the Scientific or S. B. course *must* elect *twelve hours*—that is, three hours each semester—from the electives offered in Mathematics or in Science. The student may give the entire twelve hours to one department, or divide the time as he may deem proper among the departments included in the prescribed limits.

2. The student may apply the remaining hours of elective work to any *academic* elective course (for which he is prepared) offered in the University, or to any regular academic study which is not required in that course which he is pursuing, or to a course in Pedagogy of not more than three hours a week, or to a course in Veterinary Science of not more than three hours a week.

By *academic* course is meant one not given in any of the professional schools of the University.

3. When the student has elected a subject which he has not studied before, he must pursue it for at least two semesters unless the subject is completed in less time.

4. Seniors and Juniors who have Sophomore or Freshman work (or both) to make up, *must* give such work precedence over elective work in making out their cards.

5. No student shall change an elective after two (2) weeks from the time of his enrollment in the class.

Any student not a candidate for a degree may take any subject taught in the University, in any class, for which, in the judgment of the head of department, he is sufficiently equipt.

CONDITIONS OF ADMISSION.

For admission to the Freshman class in the A. B. course are required: Two years of Latin (including Cæsar); one year of Greek; two years of Algebra and Plane Geometry. In English, elementary Rhetoric and Composition, and advanced Grammar. For other subjects, see the table of Preparatory courses, p. 58.

For admission to the Freshman class of the L. B. course, the conditions are the same as for the A. B. course, except that no Greek is required, but elementary Physics, U. S. History and American Literature instead.

For admission to the Freshman class of the S. B. course, the conditions are the same as for the L. B. course, except that German or French may be substituted for Latin.

SCHEME OF STUDIES.

A. B.	L. B.	S. B.
<i>Freshman, First Semester.</i>	<i>Freshman, First Semester.</i>	<i>Freshman, First Semester.</i>
I. Latin..... 5 III. Greek, T., W., F., S..... 4 IV. Comp. and Rhetoric, W., F..... 2 V. Geom. and Trig., T., Th., S..... 3 *Science, T., W., F., S. 4	I. Latin..... 5 IV. Comp. and Rhetoric, W., Th., F..... 3 V. Geom. and Trig., T., Th., S..... 3 VI. Ger. or Fr., T., Th., S. 3 *Science, T., W., F., S. 4	†I or VI. Ger. or French, T., Th., S..... 3 II. Biology, T., W., F., S. 4 III. Chem., T., W., F., S. 4 IV. Comp. and Rhetoric, W., F..... 2 V. Geom. and Trig..... 5
<i>Freshman, Second Semester.</i>	<i>Freshman, Second Semester.</i>	<i>Freshman, Second Semester.</i>
I. Latin..... 5 III. Greek, T., W., F., S..... 4 IV. Comp. and Rhetoric, W., F..... 2 V. Geom. and Trig., T., Th., S..... 3 *Science, T., W., F., S. 4	I. Latin..... 5 IV. Comp. and Rhetoric, W., Th., F..... 3 V. Geom. and Trig., T., Th., S..... 3 VI. Ger. or Fr., T., Th., S. 3 *Science, T., W., F., S. 4	I or VI. Ger. or French, T., Th., S..... 3 II. Biology, T., W., F., S. 4 III. Chem., T., W., F., S. 4 IV. Comp. and Rhetoric, W., F..... 2 V. Geom. and Trig..... 5
<i>Sophomore, First Semester.</i>	<i>Sophomore, First Semester.</i>	<i>Sophomore, First Semester.</i>
I. Greek..... 5 II. Anal. Geom., T., Th., S. 3 III. English, T., Th., S..... 3 IV. Latin..... 5 V. Pol. Science, W., F..... 2	I. Ger. or Fr., T., Th., S. 3 II. Anal. Geom., T., Th., S. 3 III. English, T., Th., S..... 3 IV. Latin..... 5 V. Pol. Science, W., F..... 2 VI. Pol. Science, W., F..... 2	I. Ger. or Fr., T., Th., S. 3 II. Anal. Geom., T., Th., S. 3 III. English, T., Th., S..... 3 IV. Miner'gy, T., W., F., S. 4 V. Biology, W., Th., F..... 3 V. Pol. Science, W., F..... 2
<i>Sophomore, Second Semester.</i>	<i>Sophomore, Second Semester.</i>	<i>Sophomore, Second Semester.</i>
I. Greek..... 6 II. English, T., Th., S..... 3 III. Latin..... 5 Math. or Science..... 4	I. Ger. or Fr., T., Th., S. 3 II. English, T., Th., S..... 3 IV. Latin..... 5 V. Pol. Sci., W., Th., F..... 3 Math. or Science..... 4	I. Ger. or Fr., T., Th., S. 3 II. Physics, W., Th., F., S. 4 III. English, T., Th., S..... 3 IV. Geology, T., W., Th., F. 4 VI. Anal. Geom..... 4
<i>Junior, First Semester.</i>	<i>Junior, First Semester.</i>	<i>Junior, First Semester.</i>
I. French, T., Th., S..... 3 II. Latin, T., Th., S..... 3 IV. Greek, T., Th., S..... 3 VI. German, T., Th., S..... 3 Elective..... 6	I or VI. French or Ger- man, T., Th., S..... 3 II. English, W., Th., F..... 3 III. Greek Antiquities, T., Th., S..... 3 V. Pol. Sci., T., Th., S..... 3 Elective..... 6	I or VI. French or Ger- man, T., Th., S..... 3 II. English, W., Th., F..... 3 III. Geology, T., Th., S..... 3 V. Physics, T., Th., S..... 3 Elective..... 6
<i>Junior, Second Semester.</i>	<i>Junior, Second Semester.</i>	<i>Junior, Second Semester.</i>
I. French, T., Th., S..... 3 IV. Greek, W., Th., F..... 3 VI. German, T., Th., S..... 3 Elective..... 9	I or VI. French or Ger- man, T., Th., S..... 3 II. English, T., Th., S..... 3 III. Greek Antiquities, W., Th., F..... 3 IV. Pol. Sci., T., Th., S..... 3 Elective..... 6	I or VI. French or Ger- man, T., Th., S..... 3 II. Chemistry, T., Th., S. 3 III. Astronomy, W., Th., F. 3 V. Physics, T., Th., S..... 3 Elective..... 6
<i>Senior, First Semester.</i>	<i>Senior, First Semester.</i>	<i>Senior, First Semester.</i>
I. Fr. or Ger., T., Th., S. 3 II. †Ment. and Mor. Phil. 5 Elective..... 9	I. French or German, T., Th., S..... 3 II. †Ment. and Mor. Phil. 5 Elective..... 9	I. French or German, T., Th., S..... 3 II. †Ment. and Mor. Phil. 5 Elective..... 9
<i>Senior, Second Semester.</i>	<i>Senior, Second Semester.</i>	<i>Senior, Second Semester.</i>
I. Fr. or Ger., T., Th., S. 3 II. †Ment. and Mor. Phil. 5 Elective..... 9	I. French or German, T., Th., S..... 3 II. †Ment. and Mor. Phil. 5 Elective..... 9	I. French or German, T., Th., S..... 3 II. †Ment. and Mor. Phil. 5 Elective..... 9

* Students may elect four hours of any scientific study or studies.

† If German be taken during the Freshman and Sophomore years, then French must be taken during the Junior and Senior years, and *vice versa*.

Military Science and Tactics may be taken in addition to the 18 hours of other subjects.

Military exercises held from 4:10 to 5:10 p. m., Wednesdays, Fridays and Saturdays.

† Pedagogics may be taken in place of Mental and Moral Philosophy. (See p. 84.)

PREPARATORY COURSES.

	A. B.	L. B.	S. B.
<i>First Term.</i>	I. Latin..... 5	I. Latin..... 5	I. *Latin, Ger. or Fr... 5
	II. Mathematics..... 5	II. Mathematics..... 5	II. Mathematics..... 5
	III. Civil Government... 3	III. Civil Government... 3	III. Civil Government... 3
	IV. Phys. and Hygiene. 4	IV. Phys. and Hygiene. 4	IV. Phys. and Hygiene 4
	V. Zoology..... 3	VII. Military Science or Book-keeping.... 3	VII. Military Science or Book-keeping.... 3
<i>Second Term.</i>	I. Mathematics..... 5	I. Mathematics..... 5	I. Mathematics..... 5
	II. Botany..... 3	II. Botany..... 3	II. Botany..... 3
	III. English..... 5	III. English..... 5	III. English..... 5
	IV. Latin..... 5	IV. Latin..... 5	IV. Latin, Ger. or Fr... 5
	VII. Military Science or Book-keeping.... 3	VII. Military Science or Book-keeping.... 3	VII. Military Science or Book-keeping.... 3

SECOND YEAR.

<i>First Term.</i>	I. Greek..... 5	I. English..... 5	I. English..... 5
	II. Latin..... 5	II. Latin..... 5	II. Latin, Ger. or Fr... 5
	IV. Mathematics..... 5	III. Physics..... 3	III. Physics..... 3
	VI. English..... 5	IV. Mathematics..... 5	IV. Mathematics..... 5
		V. Zoology..... 3	V. Zoology..... 3
<i>Second Term.</i>	I. Greek..... 5	II. Latin..... 5	II. Latin, Ger. or Fr... 5
	II. Latin..... 5	III. Physical Geography 5	III. Physical Geography 5
	III. Physical Geog'phy 5	IV. Mathematics..... 5	IV. Mathematics..... 5
	IV. Mathematics..... 5	VI. U. S. History and Am. Literature... 5	VI. U. S. History and Am. Literature... 5

NOTE —The Roman numerals denote the hour at which the class recites; the Arabic numerals denote the number of times per week.

*Those who elect two years of German or French in the preparatory science course, in place of Latin, will be excused from German or French in the University course, but must elect an equivalent, approved by the Faculty.

ADMISSION TO PREPARATORY COURSES.

For admission to the preparatory courses, the applicant must pass a satisfactory examination in English Grammar and Composition, and in Arithmetic (through percentage).

The full course of study pursued at the University as preparatory to the Freshman class is outlined above. This schedule of sub-Freshman work has been arranged in the belief that the majority of High schools and Academies in the State are prepared to adopt it. If any such school conform its own curriculum to any of these courses, such school shall, upon application to the President of the University, and on approval by the Faculty, be enrolled as "approved" in the University catalogue, and its certificate shall admit the bearer, without examination, to the Freshman class of such course or courses.

LIST OF APPROVED SCHOOLS.

The following schools have been approved, and their certificate will admit the bearer to the Freshman class without examination:

Name of school.	Location.	Name of school.	Location.
Bethany High School	Bethany	Marshall High School	Marshall
California High School ...	California	Maryville High School ...	Maryville
Cameron High School	Cameron	Memphis High School	Memphis
Carrollton High School...	Carrollton	Mexico High School	Mexico
Chillicothe High School..	Chillicothe.	Missouri Military Acad ..	Mexico
Clinton Academy	Clinton	Mound City High School.	Mound City
Clinton High School	Clinton	Mountain Grove Academy	Mountain Grove
Cooper Institute	Boonville	Neosho High School	Neosho
Craig High School	Craig	Nevada High School	Nevada
Ft. Smith High School ...	Ft. Smith, Ark	Odessa High School	Odessa
Hannibal High School....	Hannibal	Oterville College	Oterville
Higginsville High School.	Higginsville	Paris High School	Paris
Hooper Institute	Clarksburg	Perry Institute	Perry
Independence High School	Independence ...	Richmond High School...	Richmond
Jefferson City High School	Jefferson City...	Salem High School	Salem
Joplin High School	Joplin	Salisbury Academy	Salisbury
Kansas City High School.	Kansas City	Sedalia High School	Sedalia
Kemper Family School...	Boonville	St. Joseph High School ..	St. Joseph
Lamar High School	Lamar	St. Louis High School	St. Louis
Louisiana High School...	Louisiana	Trenton High School	Trenton
Macon High School	Macon	Wentworth Academy ...	Lexington
Marmaduke Mil. Acad ...	Sweet Springs...	Windsor High School	Windsor

NOTE.—By an order of the Board of Curators, the student who attains the highest rank in the graduating class of any approved school will be permitted to enter the Academic department of the University or the Agricultural and Mechanical College without the payment of the ordinary matriculation fees.

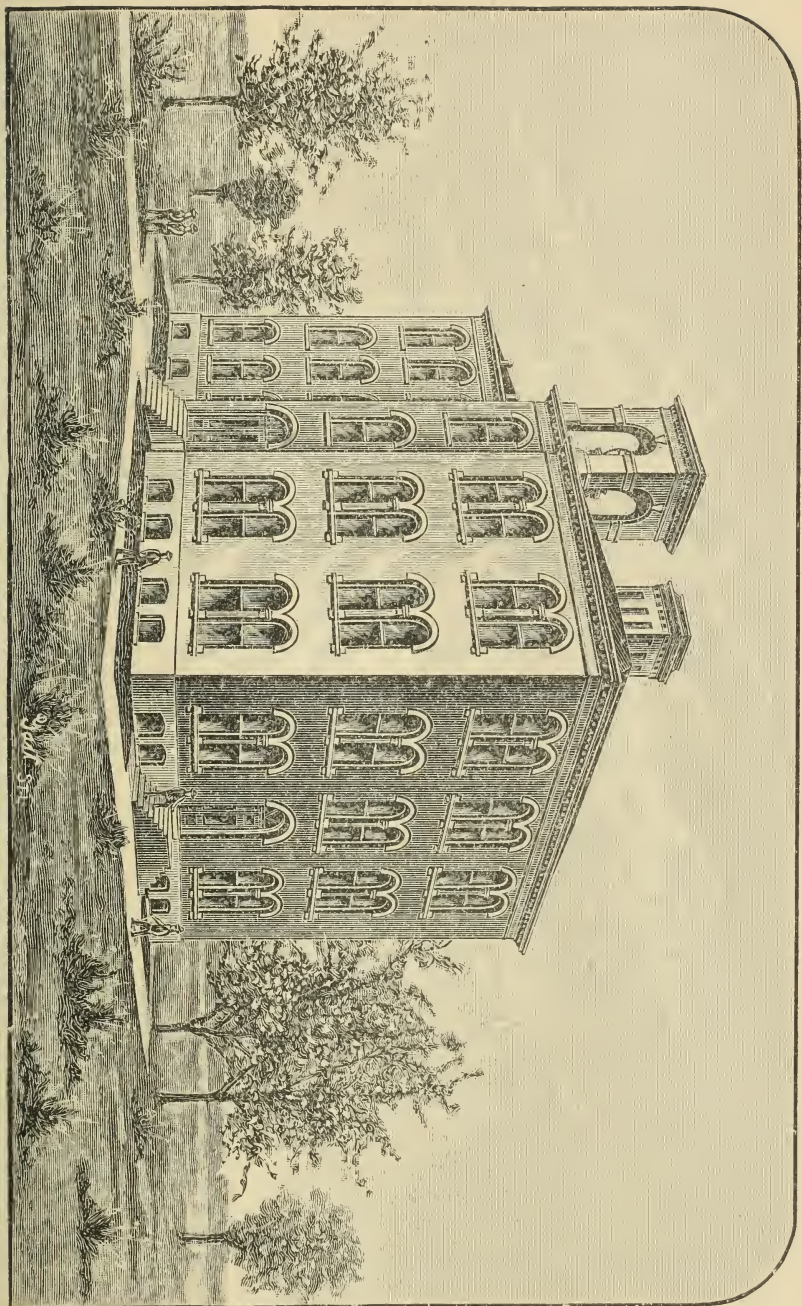
II. THE PROFESSIONAL DEPARTMENTS

OF THE

UNIVERSITY OF MISSOURI.

- XV-1. AGRICULTURE AND MECHANIC ARTS.
- XVI-2. NORMAL INSTRUCTION.
- XVII-3. LAW.
- XVIII-4. MEDICINE.
- XIX-5. MINING AND METALLURGY.
- XX-6. ENGINEERING.
- XXI-7. MILITARY SCIENCE AND TACTICS.
- XXII-8. ART.

COLLEGE OF AGRICULTURE.



ANNOUNCEMENT

OF THE

Faculty, Courses of Study and Methods of Instruction

IN THE

COLLEGE OF AGRICULTURE
AND MECHANIC ARTS.

COLUMBIA, MO.: 1892-1893.

XV. College of Agriculture and Mechanic Arts.

FACULTY.

R. H. JESSE, LL. D., President of the University,
Ex officio Chairman of the Faculty.

EDWARD D. PORTER, A. M., Ph. D.,
Dean and Professor of Theoretical and Practical Agriculture.

PAUL SCHWEITZER, Ph. D.,
Professor of Chemistry.

THOMAS JEFFERSON LOWRY, S. M., C. E.,
Professor of Engineering.

JOHN W. CONNAWAY, D. V. S., M. D.,
Professor of Veterinary Science and Comparative Medicine.

EDWARD A. ALLEN, Litt. D.,
Professor of English.

WM. B. SMITH, A. M., Ph. D.,
Professor of Mathematics.

GEORGE D. PURINTON, A. M., Ph. D., M. D.,
Professor of Botany, Entomology and Zoology.

G. C. BROADHEAD, M. S.,
Professor of Geology and Mineralogy.

M. S. KING, M. Acc'ts,
Instructor in Commercial Course.

CHARLES H. KEFFER, M. H.,
Professor of Theoretical and Practical Horticulture.

M. L. LIPSCOMB, A. M.,
Professor of Physics.

Lieutenant B. B. BUCK (detailed from the Regular Army),
Professor of Military Science and Tactics.

ALEXANDER MARTIN, A. M., LL. D.,
Lecturer on Agricultural Law.

C. W. MARX, B. E.,
Superintendent of School of Mechanic Arts.

C. B. REARICK,
Assistant in School of Mechanic Arts.

FREDERICK C. HICKS, Ph. D.,
Professor of History and Political Science.

J. P. BLANTON, A. M.,
Professor of Theory and Practice of Teaching, and Mental and Moral Science.

AGRICULTURAL EXPERIMENT STATION.

BOARD OF CONTROL:

The Curators of the University of Missouri.

EXECUTIVE BOARD OF THE UNIVERSITY:

Hon. G. F. ROTHWELL,

Hon. B. M. DILLEY,

Hon. J. S. CLARKSON.

ADVISORY COUNCIL:

The Governor of the State.

The President of the Board of Curators of the State University.

The Master of the State Grange.

The President of the State Board of Agriculture.

The President of the State Horticultural Society.

The Secretary of the State Horticultural Society.

The Professor of Agriculture, Missouri Agricultural College.

The Professor of Chemistry, Missouri Agricultural College.

The Professor of Veterinary Science, Missouri Agricultural College.

The Professor of Horticulture, Missouri Agricultural College.

The Professor of Geology, Missouri Agricultural College.

OFFICERS OF THE STATION:

EDWARD D. PORTER..... Director and Agriculturist

P. SCHWEITZER.....Chemist

CHARLES A. KEFFER.....Horticulturist

.....Assistant Agriculturist

PAUL EVANS..... Veterinarian

CHARLES P. FOX.....Assistant Chemist

A. C. VANDIVER.....Farm Superintendent

IRVIN SWITZLER.....Secretary

R. B. PRICE.....Treasurer

COLLEGE OF AGRICULTURE AND MECHANIC ARTS.

INTRODUCTION.

This College had its origin in the beneficence of National, State and local governments. Its location, objects and aims are defined in the following extracts from the acts of Congress and the laws of the State of Missouri:

Its leading objects shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the legislatures of the states may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life. (Act of Congress, 1862, Sec. 4.)

There is hereby established the Agricultural and Mechanical College, and a School of Mines and Metallurgy, provided for by the grant of the Congress of the United States, as a distinct department of the University of the State of Missouri. (Revised Statutes of Missouri, Sec. 8738.)

To effect the said leading objects of the colleges, as herein established, it is provided that the students and members thereof shall be admitted to the libraries, museums, models, cabinets and apparatus, and to all lectures and instructions of the University which now exist or may hereafter exist, and to all other rights and privileges thereof, in a manner as full and ample as are the students of any other department in said University; and to provide for instruction in military tactics, as herein required, it is enacted that in case a system of military education shall be established by Congress, the State University is hereby required by law to make the necessary provision for carrying out the plan so established in connection with the institution. (Revised Statutes, Sec. 8741, p. 2017.)

The Agricultural and the Mechanical College, and the School of Mining and Metallurgy herein provided for, shall have each a separate and distinct faculty, whose officers and professors may be the same in whole or in part as the officers and professors in other colleges and departments of the University. (Revised Statutes of Missouri, Sec. 8742.)

In consideration of the permanent location of the Agricultural and Mechanical College in connection with the State University, the county of Boone shall donate not less than thirty thousand dollars in cash, to be used in erecting such buildings and making such improvements as may be needed for such college, and also for a Mechanical College in connection with the State University, and that the same shall be held for the uses and purposes of said Agricultural and Mechanical College. (Revised Statutes of Missouri, Sec. 8744.)

In accordance with the above provisions, the citizens of Boone county made a donation of ninety thousand dollars for the erection of necessary buildings and the purchase of lands for an experimental farm, and this college was permanently located at Columbia, in connection with the University of Missouri and the School of Mines and Metallurgy at Rolla, under the same control and supported from the same congressional appropriations.

ENDOWMENT OF THE COLLEGE.

The support of the College is derived from:

1. The proceeds of the sales of the public lands donated to Missouri by the act of Congress of July 2, 1862. This State received as her share two hundred and seventy-five thousand acres, of which there have been sold up to date two hundred and sixteen thousand seven hundred and sixty acres, yielding three hundred and twelve thousand dollars, which sum is invested in a State certificate of indebtedness, at five per cent, yielding fifteen thousand six hundred dollars; of this amount one fourth, or three thousand nine hundred dollars, is by law appropriated to the support of the School of Mines and Metallurgy, at Rolla.
2. The annual appropriations from the United States treasury by the act of Congress of August 30, 1890, of fifteen thousand dollars for the years 1889-90, and increased each year by one thousand dollars, until it reaches twenty-five thousand dollars, which shall remain an annual appropriation. Of this amount, one-sixteenth is by law appropriated to the "Lincoln Institute," at Jefferson City, for the education of negro children in agriculture and mechanic arts, and one-fifth of the balance to the School of Mines and Metallurgy, at Rolla.
3. The act of Congress of March 2, 1887, known as the "Hatch bill," appropriates fifteen thousand dollars annually to the College of Agriculture, for the purpose of conducting investigations and experiments in various lines of work connected with agriculture. By the acts of Congress making the above appropriations, the expenditures are expressly restricted to the purposes of instruction, illustration and original scientific investigations in agriculture, and not one dollar can be used for the erection or repair of buildings; such facilities are to be provided by the State of Missouri.
4. The College building and Experimental farm, donated by the citizens of Boone county, and costing originally ninety thousand dollars.

The above sums, together with the assistance derived from the association of the College of Agriculture with the University, furnish an abundant income for all purposes of instruction and experimentation.

LOCATION.

The College of Agriculture and Mechanic Arts is located at Columbia, Boone county, in the north central portion of Missouri, one of the most beautiful towns of the State, containing about four thousand inhabitants, noted for their culture, refinement and morality, and surrounded by a region of country of well-known healthfulness and fertility.

Columbia is connected by a branch of the Wabash Western railroad with Centralia, whence it is accessible from all portions of the State by the Wabash and the Alton systems of railways. Three daily trains furnish ample facilities for communication with all portions of the State.

GENERAL INFORMATION.

Applicants for admission to the College of Agriculture should read carefully and follow the directions for new students given on a following page. The Dean of the College will be found in his office in Agricultural hall at the opening of each semester, from 9 to 12 o'clock, to assist students in their examinations, to direct them to suitable homes, and to advise with them in reference to their classes and studies.

CONDITIONS OF ADMISSION.

Applicants for admission to the Freshman class must be not less than sixteen years of age, and must have completed the "Public School" course of the State.

Applicants for advanced classes in the course must sustain examinations in the preparatory studies, and in all the book studies previously pursued by the class which they propose to enter; but if they have pursued such studies in any of the high schools of the State approved by the Faculty, or in other institutions of similar rank, they may receive credit for their standing in those institutions, upon presenting a certificate from the proper officers, showing that they have obtained a passing grade in courses of studies equivalent to those given here.

The proper dates for examination and admission are those given in the Calendar, and it is very important for students to be present and prepared to enter their classes at the beginning of the College year, as every absence from the lectures, recitations and exercises of the classes, after their work has begun, is a loss very difficult to regain.

EXPENSES.

There is no charge for tuition in this College, but there is an annual charge of \$10.00, to be paid on the entrance of the student, covering entrance fee, incidental expenses and library charges for that year.

Injury to the College property of whatever sort is charged to the author when known, otherwise to the section, class, or the entire body of students, as may seem most just in the individual case.

BOARDING.

Board in private families, with lodging, washing and fuel, may be obtained for \$3 to \$4.50 a week. Those who enter the clubs may reduce this amount to \$1.75.

The new club-houses afford accommodations for about one hundred and twenty students. The rooms are furnished with bedstead, stove, table and two chairs. Occupants are expected to furnish whatever else they deem necessary.

The members of the clubs have their own organization—president, commissary, secretary, censors, etc. They assess themselves, collect the money, buy their own provisions and regulate their own expenses.

The students of agriculture will have the preference of rooms in the Agricultural club buildings, which are situated on the horticultural grounds, provided application be made before the opening of the first semester, in September; the charges will be paid the same as by other students.

As the accommodations of the club-houses are limited, it will be necessary for students who wish to avail themselves of these advantages to make early application for rooms, as they are frequently all engaged before the opening of the college year. The rooms are assigned in the order of application, and requests for rooms must be made to the Proctor of the University.

COURSES OF STUDY.

The courses of study in the College of Agriculture and Mechanic Arts have been selected to fully meet the requirements of the acts of Congress providing for its organization, and while they are especially adapted to prepare students for the industrial pursuits of life, they are also sufficiently comprehensive, and of such a character as to secure the mental discipline and practical experience necessary for other callings and professions, and to qualify pupils for the duties and responsibilities of American citizenship.

OUTLINE OF STUDIES.

The subjects are more fully outlined in the following pages :

AGRICULTURE.

History of Agriculture, and its development. Brief review of the chemical composition and physical properties of air and water, and their influences combined with heat and light, upon soils and vegetation. Origin, composition and practical classification of soils; properties, treatment and adaptation of each kind of soil to the various branches of husbandry; the reclamation and improvement of soils, including drainage, sub-soiling, trenching, fallowing, preparatory tillage, fencing and road-making; manufacture, preservation and application of manures; green manures, and irrigation; farm implements and machinery; production, management and sale of the different crops of the farm; the different breeds of farm animals, their characteristics and adaptations; breeding, rearing, feeding and management, for different purposes; selection of farms, and their adaptation to the different branches of agriculture; location and erection of farm buildings, and their adaptation to the purposes for which they are intended; rotation of crops, general principles, and their practical application; dairying; selection of cows for milk, butter and cheese; best methods of feeding; farm and factory systems; methods of testing milk; improved implements and machinery, and methods of handling dairy products; work of the Agricultural Experiment stations, objects to be accomplished, and methods.

All the above subjects are illustrated by the equipment and work of the College farm, and the Experiment station. Pupils are required to devote a sufficient amount of time in both of these departments to become familiar with their practical work, and to perform all the operations of the farm with facility.

BOOKS OF REFERENCE.—Morton's *Cyclopædia*, Low's *Practical Agriculture and Domesticated Animals*, Storer's *Agriculture*, Miles on *Stock-breeding*, Thomas' *Farm Implements*; *Bulletins and Reports of the Experiment stations*, and the *Herd-books of the various Live-stock associations*.

HORTICULTURE.

The class-room instruction in Horticulture is by lectures, supplemented by written abstracts, and a discussion of the matter gone over.

The subjects treated are: Plants, their structure and the functions of their different organs, with the effect of the different conditions of the atmosphere and soil on their development; propagation of plants by seeds, cuttings, layers, buds, grafts, etc.; the nursery and its operations; forestry; fruit-growing; glass structures, their use, construction and management; market-gardening; floriculture and landscape gardening.

Students are required to devote enough time to work on the horticultural grounds to familiarize themselves with the different operations; and if they desire to make a specialty of horticulture, an opportunity is offered of working there for wages during their spare hours.

BOOKS OF REFERENCE.—Lindley's *Horticulture*, Downing's *Rural Essays and Landscape Gardening*, Loudon's *Cyclopedia of Horticulture*, the works of Warder, Fuller, Henderson and Quinn, and the horticultural reports of various states and experiment stations.

BOTANY.

This study begins with an examination of the organs of plants, after which their minute anatomy is considered. This is followed by a study of vegetable physiology, the classification of plants and vegetable products, with special reference to their agricultural and commercial uses.

The advanced course embraces a more thorough study of vegetable physiology, covering cell structure, germination, development of tissues, parasitic fungi, especially the molds, smut, rust and other cryptogamic plants.

The instruction is given by lectures, both in the class-room and in the field, supplemented by means of living plants from the gardens and green-houses of the College, objects from the Museum, and the charts, drawings and photographs prepared in the department. Each student has the use of a superior Compound microscope, and is taught the use of the instrument, and how to prepare and mount his own specimens.

Each student is required to provide himself with a pocket lens for field work, under the instruction of the professor in charge; the same instrument is used in the study of Entomology and Mineralogy.

ENTOMOLOGY.

Instruction in this study is given by a course of lectures, aided by the collection of insects in the Museum, and by work in the laboratory, gardens and fields. Especial prominence is given to the life history and habits of insects injurious to vegetation, and the methods of successfully checking their ravages.

The importance of this study to the agricultural interests of our country may be shown from the statement made by the Census bureau, that the ravages of insects amount to over \$200,000,000 annually.

ZOOLOGY.

The course of instruction in this study embraces descriptive and comparative anatomy and physiology of the classes and orders of the animal kingdom, and is given by lectures, field work and laboratory practice, at the seasons of the year most favorable for the study of animal life. In the lectures, constant use is made of the diagrams, models and specimens from the Museums, and practical dissections of some type of each class, while microscopic study is a regular portion of the laboratory work.

DRAWING AND SHOP-WORK.

The aim of the instruction in this department is not to make finished mechanics or artisans; it is not designed to be a "Trade school," but is designed, primarily, for intellectual development and discipline; and, secondarily, to cultivate habits of physical training, and to make farmers' boys familiar with the tools and processes, in working wood and iron, and to give them such training as will enable them to perform with facility the ordinary mechanical operations of the farm. The course of instruction embraces:

COURSE IN DRAWING.

First Year. Free-hand and Instrumental drawing, which is taught by lectures, and from objects, models, and flat copies, including intersections, development of surfaces, and lettering.

Second Year. Mechanical drawing, isometric projections, plans, sections, and elevations of machines, and structures.

Third Year. Geometrical drawing, tinting, brush and line shading; shades and shadows.

Fourth Year. Original professional work.

COURSE IN SHOP-WORK.

First Year. WOOD-WORKING AND PATTERN-MAKING.—This course begins with a series of exercises in wood-working, each of which is intended to give the student familiarity with a certain application of a certain tool; and the course of exercises, as a whole, is expected to enable the industrious student easily and exactly to perform any ordinary operation familiar to the carpenter, to the joiner and the pattern-

maker. Time permitting, these prescribed exercises are followed by practice in making members of structures, joints, small complete structures, patterns, their core-boxes, and other constructions in wood. Particular attention will be paid to the details of pattern-making.

Second Year. **FORGING, MOLDING AND FOUNDRY-WORK.**—These courses are expected not only to give the student a knowledge of the methods of the blacksmith and the molder, but to give him that manual skill in the handling of tools which will permit him to enter the machine-shop and there quickly to acquire familiarity and skill in the manipulation of the metals, and in the management of both hand and machine tools.

Third Year. **MACHINE-WORK.**—The instruction in the machine shop, as in the foundry and at the forge, is intended to be carried on in substantially the same manner as in the wood-working course, beginning by a series of graded exercises, which will give the student familiarity with the tools of the craft, and with the operations for the performance of which they are particularly designed, and concluding by practice in the construction of parts of machinery, and, time permitting, in the building of complete machines, which may have a market value.

Fourth Year. Original work in construction of machines or parts of machines, or special devices.

MATHEMATICS.

This course embraces a thorough review of the principles of Arithmetic, with their practical applications to the various demands of business life. Algebra, Geometry and Trigonometry are taught, with their special applications to mechanical draughting, mensuration, plane surveying and civil engineering. The leading objects kept constantly in view in this course are—first, to impart a practical knowledge of the subjects and methods of computation used in the ordinary affairs of life; and, second, to secure the discipline of the reasoning powers so essential in the advanced courses of study, and in practical life.

VETERINARY SCIENCE

Embraces an *elementary* and an *advanced* course.

The elementary course is designed for students in the "Short course" of two years, and will be given by lectures, illustrated by plates, models, skeletons and prepared specimens of the various organs of domestic animals. This course is not designed to prepare young men for veterinarians, but to give them such practical knowledge of the anatomy, physiology and hygiene of domestic animals as will enable them to handle intelligently ordinary farm stock. The course will embrace Comparative and Human Anatomy; the ordinary diseases of domestic animals and their treatment; water supply for stock; ventilation of stables; varieties of food, their value and preparation.

The Advanced course, given during the "Four Year course," will embrace a thorough knowledge of the study, including Anatomy and Physiology, both human and comparative; general Pathology and Histology; practical Medicine and Surgery; Animal Obstetrics; Bacteriology, and the study of contagious and infectious diseases.

ENGLISH LANGUAGE AND LITERATURE

Embraces a review of English Grammar, the origin, structure and use of the English language, including correct expression. Exercises in composition and declamation are continued throughout the entire course. A course in Rhetoric will be given, embracing the principles of argument, and the outlines of sound criticism. A course of lectures will be given on the English language and literature, with abundant illustrations from the best authors. Students are aided in the use of the libraries of the University, to which all members of the College of Agriculture have free access, and the various literary societies under the control of the students furnish an invaluable aid to young men, in perfecting themselves in oratory and composition.

CHEMISTRY

Includes a consideration of chemical action, with nomenclature and formulas, and a careful study of the history, manufacture, physical, chemical and physiological properties, tests and uses of the various elements and their compounds. While teaching the facts of such, it is the aim to give prominence to those which show relations and illustrate principles. Special attention is given to those substances having extended application in the arts. In addition to the usual lecture-room experiments, the student repeats, as far as practicable, all the experimental work at his private work-table.

In Chemical Analysis, each student has his stand in the Qualitative laboratory, completely furnished with apparatus and chemicals for his own use. His work includes the analysis of more or less complex mixtures of chemicals, ores, soils, mineral waters, well waters, etc.

AGRICULTURAL CHEMISTRY

Includes a thorough consideration of the application of chemical principles to the economy of the farm; the origin and formation of soils; the classification of soils; their composition; the analysis of soils, and their adaptation to the purposes of production; the composition and use of manures; composting; chemistry of farm operations, such as plowing, fallowing, draining; chemistry of plant growth; the composition of grain and fodder plants, and their use and value as food; feeding; the chemistry of milk, butter and cheese.

GEOLOGY AND MINERALOGY.

This study includes a general consideration of the earth's features; the constitution of rocks, and the arrangement of rock masses; the order of events in geological history; the order of succession of the strata of the earth's crust; and embracing the study of building materials, decomposition of rocks, and production of soils; useful minerals occurring in veins and beds; coal deposits, and the ordinary useful mineral substances; surface geology, applied to engineering and agriculture.

Instruction in this course will be given by lectures on Economic Geology and Mineralogy, Lithology, Physical Geology, and Geological surveying, and illustrated by charts, lantern projections, and the large collections of rocks, fossils, ores, minerals and specimens of building stones in the museums.

PHYSICS AND METEOROLOGY.

These subjects are taught by lectures, text-books and laboratory practice, and embrace a consideration of the laws of force and motion; the principles of the mechanical powers, and their application to the construction and use of farm implements and machinery; the movements of fluid bodies; atmospheric phenomena; the laws of heat, light, electricity and magnetism, with their application to agricultural science. After a knowledge of the fundamental principles of Physics has been obtained, students are admitted to the Physical Laboratory, where they are made practically acquainted with the construction and use of philosophical apparatus.

HISTORY AND POLITICAL ECONOMY.

These subjects are taught by lectures and recitations from standard text-books, and embrace a thorough knowledge of American history, treating of the development of political principles, the growth of population, education and industries. A course of lectures will be given on general history, with special reference to the origin of American ideas and institutions and the progress of civilization.

Under the head of Political Economy will be given a presentation of subjects connected with production, distribution and consumption of wealth, with special reference to the questions of wages, profits, trade unions, money, interest, usury laws, systems of taxation and finance. Special attention will be given in this department to the principles of civil governments, and the study of the Constitutions of the United States and of the State of Missouri.

For detailed information in regard to courses etc., see page 44.

MENTAL AND MORAL SCIENCE.

A course of lectures will be given upon these subjects, covering the laws governing the operations of the human mind, such as the relations of body and mind, the senses as factors in mental life, the laws of association and memory, the nature of reasoning and practical applications, especially in the field of education.

In Ethics the aim will be to lay a foundation for systematic thought on the problem of morals. Theories of right and wrong and correct principles of action are made the means of a clear understanding of the nature of government in various forms, with special application to individual rights and duties.

A BUSINESS COURSE

Will embrace thorough and systematic instruction in penmanship, commercial arithmetic and book-keeping, with special reference to the business of the farmer and artisan. Students will be drilled in the use of the several account books, and common business forms, in folding and filing papers, and in conducting business correspondence, the object being to lay the foundation for correct business habits and methods, so much wanted by the majority of American farmers.

FARM ENGINEERING.

As much instruction will be given in this study as will qualify the students in Agriculture to perform intelligently the operations of land surveying, leveling, the location and construction of ditches, drains, farm and country roads.

MILITARY SCIENCE.

An officer of the Regular army is detailed by the War department as Professor of Military Science and Tactics, to carry out the provisions of the act of Congress of 1862, which, in endowing this and similar institutions, stipulates that military tactics shall be taught.

All students entering this department are required to conform to the rules and regulations prescribed for the Military School, as contained in the subsequent pages of this Catalogue. The requirements of this department are so adjusted as to harmonize with the regular academic work of the students.

NORMAL INSTRUCTION.

As numbers of young men from the industrial classes expect to engage in teaching, either as a life work or as a means of partial support during their college course, and as there is a growing demand among the farmers of our country for the introduction of the study of agriculture in the public schools, it has been deemed advisable to establish in the College of Agriculture a chair of Pedagogics, in which will be given a course of instruction on the theory and practice of teaching, on school law and hygiene, and on school management. This course will be elective, but all students will be required to take the course in Agriculture.

The studies in the College of Agriculture and Mechanic Arts, as above outlined, are arranged in the following courses:

I. A THREE MONTHS' WINTER COURSE.

To meet the wants of a class of young men who have not the time to go to college for a regular course of study, but who desire to secure a certain amount of practical instruction, bearing upon the work of the farm, and to aid them directly in its prosecution.

The instruction in this course will be given by means of lectures and practical illustrations; text-books will not be used except for reference.

This course will cover those specific fields of the science and art of agriculture, that will have a direct business value to farmers. Fundamental principles of science, in its relation to agriculture, will be so far presented as to reveal the laws upon which certain operations of agriculture rest, while at the same time a discussion of the world's best methods, as gained by experience, will be required—the equipment of the college, and its farm, affording some aid in the work.

There will be lectures by the teachers of Agriculture, by successful farmers, by the Professors of Horticulture, Veterinary Science, Chemistry, Botany, and by others.

This course will be given during the months of January, February and March. Students entering it must be at least sixteen years of age, and have a good common-school education. No entrance examinations will be required, and an entrance fee of \$5 will cover all college expenses.

II. A TWO YEARS' COURSE.

This course is designed to take young men of fair average ability, not under sixteen years of age, and with such preparation as can be obtained in good district schools of the State, and give them a sound practical training that will broaden and strengthen them as citizens of the State, while it educates them in such branches of natural science as will cultivate their tastes for industrial pursuits and develop skill in their practice.

This course embraces the First and Second years of the regular Four Years' course, and those students who have not the opportunity of continuing their studies will find this an excellent preparation for practical life, and the introduction of the industrial feature, by devoting two hours of each day to work on the farm, in the gardens, in the work-shop or in military drill, will keep up habits of industry, physical training, and that respect for labor, which will tend to send the student back to the farm from choice, and not to educate him away from it.

III. A FOUR YEARS' COURSE.

This course is a two years' extension of the previous course, and is designed to give young men an advanced training in the higher departments of collegiate work, and to prepare them to enter upon their avocations in life as successful farmers, superintendents of farms, engineers, veterinary surgeons, botanists, entomologists, agricultural chemists, or lecturers.

Students completing this course will be entitled to the diploma of the University, conferring upon them the degree of B. Agr.

IV. A TWO YEARS' POST-GRADUATE COURSE

Is designed to give a professional training in one or more of the schools of this College to graduates of the College, or of other colleges of the same character.

Young men completing this course and complying with the requirements for graduation will receive the degree of M. Agr.

COURSES OF STUDY.

FARMERS' LECTURE COURSE.

(Twelve weeks.)

LECTURES ON AGRICULTURE.

Subjects: Soils, their origin and classification; tillage; farm manures and commercial fertilizers; rotation of crops; live stock; breeding and feeding; dairy farming.

LECTURES ON AGRICULTURAL CHEMISTRY.

Subjects: Study of the more important elements as applied to agriculture; chemistry of soils, their composition and relation to light, heat and moisture; physiology of plant growth; composition and feeding value of cattle food; the chemistry of the dairy.

LECTURES ON BOTANY.

Subjects: Analysis of plants; how plants grow; economic botany; smut of grains; diseases of plants and their remedies.

LECTURES ON HORTICULTURE.

Subjects: Origin of varieties of fruits, flowers and vegetables; cross-fertilization; practical work in horticulture; budding, grafting, layering; construction and management of hot-beds and cold frames; parasites and insecticides.

LECTURES ON VETERINARY SCIENCE.

Subjects: Anatomy of the leading domestic animals, illustrated by skeletons, charts and the celebrated "Azoux" anatomical models; examination of the horse for soundness; diseases of the feet, limbs, stomach and lungs; wounds and their treatment.

LECTURES ON ZOOLOGY.

Subjects: The evolution of animal life; the classification of the animal kingdom; study of the vertebrate sub-kingdom, including the muscular, alimentary, nervous and circulatory systems, and the organs of respiration, secretion and reproduction.

The lectures in the above course will begin on January 5, 1893, and will be continued daily, except Sunday and Monday, until March 25, 1893. Three lectures will be given each day, and the remaining time can be used by the student in work in the shops, laboratories, museums and libraries.

THE TWO YEARS' COURSE.

First Year.

First Term.

Elements of Agriculture.
Practical Mathematics and Algebra.
Analysis of Language.
Commercial Course.
Anatomy and Physiology.
Shop-work and Drawing.
Military Science (optional).

Second Term.

Elements of Agriculture.
Algebra.
Rhetoric.
Commercial Course.
Civil Government.
Shop-work and Drawing.
Military Science (optional).

Second Year.*First Term.*

Horticulture.
 Geometry.
 English Literature.
 Elementary Chemistry.
 Elementary Physics.
 Shop-work and Drawing.
 Military Science (optional).
 Normal Instruction (optional).

Second Term.

Agriculture.
 Trigonometry and Surveying.
 Botany.
 Agricultural Chemistry.
 Elementary Veterinary.
 Shop-work and Drawing.
 Military Science (optional).
 Normal Instruction (optional).

The above will constitute the "Two Years' course," and students completing it will be entitled to a certificate of the College, testifying to that fact.

This course is preparatory to the "*Degree*," or

THE FOUR YEARS' COURSE.**Third Year.***First Term.*

Advanced Agriculture.
 Entomology.
 Higher Algebra.
 Organic Chemistry.
 Advanced Physics.
 Political Science.
 Farm-work and Laboratory Practice.

Second Term.

Horticulture and Forestry.
 Zoology.
 Advanced Geometry.
 Agricultural Chemistry.
 Advanced Physics.
 Political Science.
 Horticult'l work and Laboratory practice.

Fourth Year.*First Term.*

Horticulture.
 Mineralogy.
 Agricultural Engineering.
 Veterinary Science.
 Experiment Station work.
 Elective Studies.

Second Term.

Geology.
 Veterinary Science.
 Experiment Station work.
 Elective Studies.

THE COLLEGE YEAR.

This commences September 13, 1892, and closes with the annual Commencement exercises, Thursday, June 1, 1893.

The year is divided into two terms: The first term opens September 13, 1892, and closes January 30, 1893; the second term opens January 31, 1893, and closes June 1, 1893.

STUDY HOURS.

Recitations, lectures and practical exercises are conducted Tuesday, Wednesday, Thursday, Friday and Saturday of each week, and the hours for the College of Agriculture are from 9 o'clock to 1 o'clock, and from 2 o'clock to 5 o'clock. Chapel exercises are held from 8:45 to 9 o'clock, at which all students are expected to be present.

FACILITIES FOR INSTRUCTION.

Museums, Apparatus and Farm Library.—A valuable library of farm books has been collected, to which additions are being made. In addition to the Agricultural library, the students of the Agricultural College have access to the libraries of all the associated schools.

Agricultural Museum.—Large additions have been made to this Museum of objects especially adapted to illustrate the lectures in agriculture and agricultural botany. The World's Exposition at New Orleans was the source of much valuable matter. The Museum now contains an unusually fine collection of wool and of cotton fibers, numbering about 600 specimens. These fibers represent most all civilized sections of the world. The wool fibers include the various breeds of sheep, affording as a whole, opportunity to study the influence of climate, soil and breed on wool fiber. Various fiber-producing plants are well represented, and are often accompanied by the various manufactured products. Nearly all of the woods of the State are represented by three feet of the trunk of such tree, so prepared as to show its heart and sap in the rough and under polish. The grasses of the State are represented by 125 species, collected by a graduate of the Agricultural College. In addition to the grasses of the State, the Museum contains one of the finest general collections of grasses in the country. In seeds it contains ninety Japanese varieties, 150 species of American farm seeds, and a great number of varieties of wheat, corn, oats and barley. It has 179 different grades of the milling products of wheat. It contains several hundred models of farm machinery. Sorghum and all its varied products are represented by forty-six objects. A large collection of miscellaneous materials of great value that cannot be enumerated. The list contains many woods and their products from the States of this country and from South America and Europe; also a long list of plants and their products.

In addition to these means of illustration, 318 lantern slides have been already collected of the larger number intended. These are found to be a very great aid to the lecture-room.

Chemical and Physical Laboratories.—Laboratories in each of these departments are well supplied with modern appliances for illustrating lecture-room teaching.

Green-house.—A green-house, which is connected with the Horticultural department, affords invaluable assistance in connection with the botanical studies and for the improvement of plants.

Farm.—The farm is divided into two departments—Farm and Horticultural—both of which were well equipped with buildings, stock and tools of modern character. But owing to a disastrous fire in 1889, the barn, implements and machinery were totally destroyed. They have been partially replaced, and it is hoped that necessary appropriations will be made by the next Legislature to thoroughly equip the farm for the best work. The farm consists of 700 acres of land of varying quality, and is well adapted to its purpose of instruction and experiment work. The students will be required to perform such labor on the farm as is deemed necessary for the acquirement of proficiency in the methods taught, and will be compensated according to the character and amount of the work to be done, ten cents being the maximum pay per hour. In addition to this field labor, students will be required to perform farm labor whenever it is desirable to illustrate lecture-room teachings. Such work will be done without pay.

Experiments will be constantly carried on for the farming interests of the State and for lecture-room work. Students will be required to assist in the experiments.

The Horticultural department will stand in the same relation to the lecture-room and to the public that the farm does. It is an indispensable aid in teaching the student small-fruit culture, grafting, budding, pruning, hot-house propagation, vegetable gardening, etc.

In the orchard and fruit garden are about 800 varieties of fruits, which are used in illustrating lecture-room work and for experimental purposes.

THE AGRICULTURAL EXPERIMENT STATION.

This station is made by the act of Congress of 1837, and by the acts of the General Assembly of Missouri accepting its provisions, and by the order of the Board of Curators of the University of Missouri, a department of the College of Agriculture.

The following are the essential sections of the act of Congress referred to, and define clearly the objects to be accomplished in the organization of these stations:

AN ACT to establish agricultural experiment stations in connection with the colleges established in the several states under the provisions of an act approved July second, eighteen hundred and sixty-two, and of the acts supplementary thereto.

Be it enacted by the Senate and House of Representatives of the United States of America, in Congress assembled, That in order to aid in acquiring and diffusing among the people of the United States useful and practical information on subjects connected with agriculture, and to promote scientific investigation and experiment respecting the principles and application of agricultural science, there shall be established, under direction of the college or colleges or agricultural department of colleges in each state or territory established, or which may hereafter be established, in accordance with the provisions of an act approved July second, eighteen hundred and sixty-two, entitled "An act donating public lands to the several states and territories which may provide colleges for the benefit of agriculture and the mechanic arts," or any of the supplements to said act, a department to be known and designated as an "agricultural experiment station:" *Provided*, that in any state or territory in which two such colleges have been or may be so established, the appropriation hereinafter made to such state or territory shall be equally divided between such colleges, unless the legislature of such state or territory shall otherwise direct.

SEC. 2. That it shall be the object and duty of said experiment stations to conduct original researches or verify experiments on plants and animals; the diseases to which they are severally subject, with the remedies for the same; the chemical composition of useful plants at their different stages of growth; the comparative advantages of rotative cropping as pursued under a varying series of crops; the capacity of new plants or trees for acclimation; the analyses of soils and waters; the chemical composition of manures, natural or artificial, with experiments designed to test their comparative effects on crops of different kinds; the adaptation and value of grasses and forage plants; the composition and digestibility of the different kinds of food for domestic animals; the scientific and economic questions involved in the production of butter and cheese; and such other researches or experiments bearing directly on the agricultural industry of the United States as may in each case be deemed advisable, having due regard to the varying conditions and needs of the respective states and territories.

SEC. 4. That bulletins or reports of progress shall be published at said stations at least once in three months, one copy of which shall be sent to each newspaper in the states or territories in which they are respectively located, and to such individuals actually engaged in farming as may request the same, and as far as the means of the station will permit. Such bulletins or reports and the annual reports of said stations shall be transmitted in the mails of the United States free of charge for postage, under such regulations as the Postmaster-General may from time to time prescribe.

SEC. 5. That for the purpose of paying the necessary expenses of conducting investigations and experiments and printing and distributing the results as hereinbefore described, the sum of fifteen thousand dollars per annum is hereby appropriated to each state, to be specially provided for by Congress in the appropriations from year to year, and to each territory entitled under the provisions of section eight of this act, out of any money in the treasury proceeding from the sales of public lands, to be paid in equal quarterly payments, on the first day of January, April, July and October in each year,

to the treasurer or other officer duly appointed by the governing boards of such colleges to receive the same, the first payment to be made on the first day of October, eighteen hundred and eighty-seven: *Provided, however,* that out of the first annual appropriation so received by any station an amount not exceeding one-fifth may be expended in the erection, enlargement or repair of a building or buildings necessary for carrying on the work of such station; and thereafter an amount not exceeding five per centum of such annual appropriation may be so expended.

It will be noted that the act of Congress of 1862 was designed to promote Agricultural education, while that of 1887 provides for Agricultural investigation.

In accordance with the provision with the above act of Congress, the Board of Curators of the University of Missouri in January, 1888, reorganized the Experiment station by transferring to it the entire use of what has been known as the "Agricultural College farm," upon which for many years this work of experimentation had been conducted by the Professor of Agriculture of the College.

The results of these experimental investigations have been given to the public in a series of bulletins or reports, which are furnished free of charge to any one applying for the same. These bulletins are numbered from 1 to 35 of the Farm series, and 1 to 17 of the Station series, since its reorganization.

NOTICE.

Any information desired concerning the College of Agriculture or the Experiment station will be cheerfully given upon application to

EDWARD D. PORTER,

Dean of the College of Agriculture and Director of the Experiment Station.

Work done in the College of Agriculture and Mechanic Arts during the year 1891-2.

As this College was reorganized in September, 1891, only the First Year class has been admitted.

The following table exhibits the whole number of students in attendance, both regular and special, from September 8, 1891, to June 2, 1892; also the number in the several classes:

Class	Regular	Special	Total
Agriculture	71	5	76
Horticulture	8	8	16
Shop-work	53	18	71
Drawing	65	24	89
Mathematics	92	16	108
English Language	71	10	81
Civil Government	47	61	108
Commercial Course	71	90	161
Anatomy, Physiology and Hygiene	46	...	46
Veterinary Science	6	7	13
Normal Instruction	4	...	4
Military Science and Tactics	25	...	25
Number of students in all classes			790
Deduct all counted more than once			585
Total number of individual students			205

XVI. Normal Department.

FACULTY.

R. H. JESSE, LL. D.,

President.

J. P. BLANTON, A. M., Dean,

Professor of Theory and Practice of Teaching, and Mental and Moral Philosophy.

PAUL SCHWEITZER, Ph. D.,

Professor of Chemistry.

J. S. BLACKWELL, M. A., Ph. D.,

Professor of Semitic and Modern Languages.

J. C. JONES, A. M., Ph. D.,

Professor of Latin.

EDWARD A. ALLEN, Litt. D.,

Professor of English.

WM. B. SMITH, A. M., Ph. D. (GOETT.),

Professor of Mathematics and Astronomy.

GEORGE D. PURINTON, A. M., M. D., Ph. D.,

Professor of Biology.

G. C. BROADHEAD, M. S.,

Professor of Geology and Mineralogy.

M. L. LIPSCOMB, A. M.,

Professor of Physics.

W. G. MANLY, M. A. (HARV.),

Professor of Greek.

JOHN W. CONNAWAY, D. V. S., M. D.,

Professor of Physiology.

FREDERICK C. HICKS, Ph. D.,

Professor of History and Political Science.

C. W. MARX, B. E.,

Superintendent of Shop-work in Department of Mechanic Arts.

CHARLES B. REARICK,

Professor of Drawing.

M. S. KING, M. Acc't's,

Instructor in Penmanship and Book-keeping.

Professor of Elocution.

NORMAL COURSES.

There are two distinct Normal courses, one Elementary and one Academic.

The Elementary course extends over two years, and is intended to prepare teachers for the public schools of the State. Graduates in this course receive a State certificate, which entitles the holder to teach for a period of two years from date of graduation.

The following is the Elementary course:

ELEMENTARY NORMAL COURSE.

	JUNIOR YEAR.	No. times per week.
First Semester....	*Elocution	2
	English Grammar and Analysis (third semester)	5
	Algebra and Plane Geometry (third semester)	5
	Physiology and Hygiene	3
	Zoology	3
	*Drawing	2
Second Semester..	American Literature	2
	Physical Geography	5
	Elementary Botany	3
	English Composition	5
	SENIOR YEAR.	
First Semester....	English History	2
	English Literature	3
	Elementary Physics	3
	Book-keeping and Penmanship	3
	†Pedagogics	5
	U. S. History and Civil Government (Lectures and Recitations)	3
Second Semester..	English Literature	3
	Young Chemist.	3
	Rhetoric	2
	†Pedagogics	5

* Elocution and Drawing are required in all four semesters two hours a week.

† Pedagogics in the above course embraces the study of educational psychology, the history of educational theories and the organization and management of schools.

ACADEMIC NORMAL DEGREE (Pe. B.).

The degree of Bachelor of Pedagogics is conferred upon regular graduates of the University in any one of the three academic courses (see page 57) who supplement their academic work by the courses in Pedagogics, which are given below. Those who take this degree receive a diploma which is a life certificate to teach anywhere in the State.

First Semester—

1. Theoretical and Critical: A consideration of the philosophic basis of education. Recitations and Lectures. Text-books: Compayre's Lectures on Pedagogy. Tu., Th., Sat., — hour.

2. History of Education: Comparative education, ancient and mediæval. Recitations and Lectures. Text-books: Compayre's History of Pedagogy and Quick's Educational Reformers. Wed. and F., — hour.

Second Semester—

3. **Practical:** The application of the principles to the teaching of the various branches of school education. The art of questioning and examining; illustration and exposition; school supervision, embracing general school management, the art of grading and arranging courses of study, the conduct of Institutes, etc. Recitations and Lectures. Text-books: Compayre's *Lectures on Pedagogy*; Payne's *Chapters on School Supervision*. Tu, Th., Sat., — hour.

4. **History of Education:** Comparative education, modern. Recitations and Lectures. Text-book: Compayre's *History of Education*. Wed. and F., — hour.

These courses are open to Juniors, Seniors and graduates, and are so arranged that academic students may distribute the work over the Junior and Senior years, or take all of it in the Senior year. Graduates of colleges of approved standing in the regular academic courses will, upon the completion of the above courses at the University, be granted the degree of Bachelor of Pedagogics and the life certificate to teach anywhere in Missouri.

ELECTIVE.

5. **Pedagogic Seminary:** Examination of Rosenkranz's *Philosophy of Education*. Discussions and essays on educational topics, and reports on visits to schools. Th., — hour.

Course 5 is intended only for students who have completed Course 1, or its equivalent.

6. **Teachers' Course:** Special courses of instruction were offered by professors in the University to the teachers of the State, beginning April 1, 1892, and continuing two months.

The following course in Pedagogics was among this number:

I. A consideration of (1) the subjects of instruction in the common-school curriculum to determine their relative values from the practical and culture standpoints; (2) the position of the instrumentary branches in school and their educative value; (3) the communication of "real" knowledge as a part of school work, including the knowledge necessary for the welfare of the individual and the citizen.

II. **The Art of Teaching**—The characteristics of teaching will be considered as they affect the subject-matter of instruction, its arrangement, the mode of communicating it, the language employed and the teacher's personal manner.

The ordinary mistakes in teaching will be pointed out.

III. **The History of Education**—The course will conclude with ten lectures on the history of educational theories, in which the following subjects will be discussed:

The Influence of the Introduction of Christianity on Education—Education in the Early Church—The Renaissance—The Reformation—Luther and Melancthon—Ratich and Comenius—Rabelais and Montaigne, Milton, Locke, Rousseau and Pestalozzi.

Something of the above nature and scope will be offered in 1893, beginning April 1st, announcement of which will be made during the second semester by circulars to the teachers. No fees are charged for any of these special courses.

ENROLLMENT.

Number of students in the Normal department.....	124
Candidates for graduation:	
Academic degree (Pe. B.).....	13
Elementary course.....	32

XVII. Law Department.

FACULTY.

RICHARD H. JESSE, LL. D.,

President of the University.

ALEXANDER MARTIN, A. M., LL. D.,

Dean of the Faculty and Professor of Law.

JAMES A. YANTIS, LL. B.,

Professor of Law.

JOHN D. LAWSON, B. C. L., LL. D.,

Professor of Law.

SPECIAL LECTURERS.

ANDREW W. MCALESTER, A. M., M. D., Dean of the Medical Department,

Lecturer on Medical Jurisprudence.

PAUL SCHWEITZER, Ph. D.,

Lecturer on Toxicology.

FREDERICK C. HICKS, Ph. D.,

Lecturer on the Theory of Jurisprudence.

HON. GEORGE B. MACFARLANE, Judge of the Supreme Court of Missouri,

Non-resident Lecturer on Criminal Law.

HON. SEYMOUR D. THOMPSON, LL. D., Judge of the St. Louis Court of Appeals,

Non-resident Lecturer on Law of Corporations.

HON. _____,

Lecturer on the Law of Wills and Administration.

HON. JAMES A. SEDDON, A. M., LL. B., Ex-Judge of Circuit Court of St. Louis,

Non-resident Lecturer on Commercial Law.

HON. UPTON M. YOUNG, of the St. Louis Bar,

Non-resident Lecturer on Equity Jurisprudence.

HISTORICAL STATEMENT.

The Law School was formally opened as a department of the University on the first Monday of October, 1872, since which time it has continued with uninterrupted progress and increasing success. Connected with its advancement in the past will be found the names of Judge Philemon Bliss, who, in his day, was a Judge of the Supreme Court of Missouri, and author of the well-known treatise on Code Pleading; Prof. C. G. Tiedeman, author of numerous valuable treatises on different subjects of the law, written during his connection with the school; Hon. Boyle Gordon, and Hon. Odon Guizar, eminent practitioners at the bar of Missouri.

ADVANTAGES.

The advantages now offered by the University of Missouri for instruction in the science and practice of the common law, as prevailing in the United States, are not excelled in any university of the West.

ACCOMMODATIONS.—Two large lecture-rooms, with a large room for the Law library, have been set apart in the University building for the exclusive use of the Law department. These rooms are all on the same floor and communicate with each other.

Since the above was written, the building containing the rooms for the Law department has been destroyed by fire. The Curators are erecting a building for the exclusive use of the Law department. At present, ample accommodations are furnished in the court-house.

Lectures and recitations begin in both lecture-rooms at 9 o'clock a. m., and close at 1 o'clock p. m., daily. Moot courts are held in the lecture-rooms or library room every Friday at 3 o'clock p. m. Lectures and recitations are held in the afternoon when necessary to meet the requirements of the school.

LIBRARIES.—The library of the Law department consists at present of a large collection of reports, and treatises on every subject of the law. It is increasing rapidly every year. All the decisions of the American courts are received at the library as soon as published. A complete set of digests of decisions and reports is kept up, so that the latest expressions of authority are brought within reach of the students and professors. Members of the Law department have access to the general library of the University. The Law library was mostly saved from loss by the fire, and will be considerably increased this year.

LOCATION.—The University of Missouri is located in the town of Columbia, in Boone county, near the center of the State, within a five hours' ride from St. Louis, on the Wabash Western railway. The site of the town occupies a high and healthy plateau of the most fertile and beautiful land in Missouri. It is a place noted for the hospitality, cultivation and refinement of its society, which is generously opened to the youth of both sexes who resort to the University for education.

The connection of the Law department with the University enables the law student to pursue any branch of instruction in the Academic department, which does not interfere with his legal studies, without additional charge. Some of the members of every class have found it convenient to pursue studies in the Academic department, such as Latin, logic, rhetoric, military tactics, history, etc.

UNIVERSITY SOCIETIES.—Members of the Law School are eligible to membership in the two great literary societies of long standing in the University known as the "Athenæan" and "Union Literary." They are also eligible to membership in the "Bliss Lyceum," a society founded in connection with the Law department, and to which members of that department alone are admitted.

These societies in the University are its nurseries of oratory, debate and parliamentary law.

METHODS OF INSTRUCTION.

LECTURES, RECITATIONS, EXAMINATIONS AND STUDY OF TREATISES AND CASES.

The first benefit inuring to the student who enters a good law school is to learn how to read law.

A student in an attorney's office is too apt to continue in his reading of law the aimless and superficial habit contracted by him in the perusal of newspapers, literary periodicals and novels.

To read law with any hope of success, it is necessary that the student should read and re-read slowly, carefully considering the exceptions and qualifications to the principles embodied in the text; he should also make an abstract, in his own hand, of the substance of the text; and, after this is done, he should review each day's work, and consult references made in any part of it which he may not thoroughly understand.

He should also consult dictionaries to assist him in obtaining a definite and precise knowledge of legal terms and phraseology.

The Law Faculty is more satisfied than ever that the highest results cannot be reached by lectures alone, however clear and thorough they may be; but that the student as far as possible should be required to study the text of some approved treatise on the subject of instruction, and to examine critically well-considered cases illustrating the principles discussed in the lecture-room. For the purpose of ascertaining the progress of the student, and impressing upon him the necessity and advantages of precise and definite knowledge of the subjects upon which he has received instruction, he should be required to stand frequent recitations and examinations on the work accomplished by him. He should also be required to take notes of the substance of the lectures, and of the cases furnished by the professor for his investigation. In this manner, it is believed, he will receive the full advantages of the lecture and recitation methods of instruction as applied to the study of treatises and the examination and analysis of cases. A combination of these methods has, in the opinion of the Faculty, produced the most satisfactory results.

Moot Court.—A Moot Court is held every Friday, in which members from all the classes participate. In this court the matters discussed arise in some supposed cause. Regular pleadings are required, and, when the cause is supposed to be in the Supreme Court, in addition to the pleadings, papers are prepared, necessary in actual practice, as the writ of error, assignment of errors, bill of exceptions embodying the instructions to the jury, rulings upon the admission or exclusion of evidence, motions for new trial or in arrest, etc. Briefs of points and authorities must also be submitted and filed. A member of the Senior class or Post-graduate class is called to sit as special judge in each cause, who, the next week, gives his opinion in writing, subject to appeal to the member of the Faculty present at the trial.

COURSES OF STUDY.

The principal object of the courses of study adopted in the school is to qualify the graduates for an efficient and successful discharge of their duties as licensed attorneys. It has never been within the aim of the school to cram its students for the purpose of qualifying them to pass the special examinations which may possibly take place at the bars to which they may seek admission. The courses of study have been adopted with the view of familiarizing the successful candidate for a degree with the principles of substantive law, and the law of remedy and procedure, as prevailing in American jurisprudence. After a short study of the statutes and decisions of the State in which he expects to settle, he will deserve admission to its bar. As the degree of LL. B. from this school entitles the graduate to admission to the bar of the State of Missouri, the faculty cannot overlook the fact that a fair knowledge of the general statutes of the State, and of the modifications which the common law has undergone in the decisions of the courts, is an essential qualification for admission to its bar. But, as there is great similarity in the general statute and judiciary law of the Western, Northwestern and Southwestern

states, it is believed that what may be learned in that respect will be of benefit to a student settling in any of said states.

UNDER-GRADUATE COURSE.—The full Under-graduate course is for a term of two years. The students in it constitute two classes: Juniors and Seniors. The Juniors pursue the studies of the first year; the Seniors the studies of the second year. Instruction is given daily to these classes, in the form of lectures, recitations and examinations upon the text-books recommended and leading cases furnished by the Faculty. Every Friday they participate in the exercises of a Moot Court.

The Junior class will receive instruction on the following subjects:

Elementary Law and the Law of Torts:

By Professor YANTIS.

Contracts, Personal Property, Bailments, Sales, Domestic Relations and Criminal Law:

By Professor LAWSON and Special Lecturers.

Negotiable Instruments:

By the DEAN and Special Lecturers.

The Senior class will receive instruction on the following subjects:

Real Property, Evidence and Corporations:

By Professor YANTIS and Special Lecturers.

Agency, Partnership and Insurance:

By Professor LAWSON.

Equity Jurisprudence, Pleading and Practice, Admiralty, Maritime Law, Constitutional and International Law:

By the DEAN and Special Lecturers.

Law of Wills and Administration:

By Special Lecturers.

Theory of Jurisprudence:

By FREDERICK C. HICKS, Ph. D., Special Lecturer.

TEXT-BOOKS.

The text-books recommended for the Junior year are as follows:

Robinson's Elementary Law.

Lawson on Contracts.

Browne on Domestic Relations.

Bigelow on Torts.

Tiedeman on Sales.

Tiedeman on Commercial Paper.

Lawson's Leading Cases on Criminal Law.

Schouler on Bailments.

Darlington on Personal Property.

The text-books recommended for the Senior year are as follows:

Bispham's Principles of Equity.

Tiedeman on Real Property.

Bliss on Code Pleading.

Greenleaf on Evidence (1st vol.).

Taylor on Corporations.

Barber on Insurance.

Pollock on Partnership.

Mechem on Agency.

Werner on Administration.

Cooley's Principles of Constitutional Law.

Woolsey's International Law.

Desty on Shipping and Admiralty.

Desty's Federal Procedure.

POST-GRADUATE COURSE.

On the 18th of April, 1891, a further and additional course of instruction and study in the Law department was established by the Board of Curators. It occupies one year, and was opened for the first time in October, 1891. It is open to graduates of the two years' course in the Law department, and to graduates from other law schools who have completed a similar or equivalent course.

The object of this course is to provide the future practitioner with a more extended and practical knowledge of the most important subjects embraced in modern law, than the limited time of the under-graduate course will admit of. It is also intended to afford him assistance in prosecuting the study of any particular subject or department of law which he expects to follow specially in his future practice.

The course of instruction will embrace lectures and recitations on the following subjects: Constitutional Law, Corporations, Insurance, Trusts, Patents, Law of Homicide. The student in this course will be allowed to select any special subject in law for extended examination and study, to be prosecuted concurrently with the subjects embraced in the course. His examination and study will be directed by the Faculty, who will advise him of the books and cases to consult, and afford him assistance and counsel when called upon.

It is believed that many licensed attorneys, beginning or about to begin practice, will find it to their advantage to take the instruction of this course as special students.

The text-books recommended for the Post-graduate course are as follows:

- Lawson on Usages and Customs.
- Cooley on Constitutional Limitations.
- Miller on the Constitution of the United States.
- Lewin on Trusts (with Scott's notes).
- May on Insurance.
- Walker on Patents.
- Bishop on Criminal Law.
- Cook on Stockholders and Corporations.
- Thompson on Corporations (in course of preparation).

SPECIAL COURSES.

Students who do not wish to take any of the full courses, and who are not candidates for any of the degrees awarded to those who have successfully completed said courses, will be permitted to take an elective course, and pursue any branches of study and instruction, the exercises of which do not conflict with each other. They will be classed as special students, and will receive certificates from the Faculty of the time spent at the school, and the work accomplished by them. Those desiring to become special students are recommended to advise with the Faculty before fixing upon the special studies which they expect to pursue.

QUALIFICATIONS FOR ADMISSION.

UNDER-GRADUATE COURSE.

Junior Class.—For admission to the Junior class, no examination in law is imposed. In respect to academical education, candidates are advised to complete, if they can, a full academic or collegiate course. A good common-school education at least must be possessed by the candidate. The Faculty must be satisfied of this by certificates to that effect from instructors in the public schools, or by examination of the candidates conducted by themselves, or by professors in the English department of the University. If unknown to the Faculty, the candidate must bring testimonials of good character.

Candidates will be admitted to the Junior class at any time during the Junior year, upon passing an examination upon the work accomplished by the class at the date of the examination.

Senior Class.—No one will be admitted to the Senior class as a candidate for a degree unless he applies at the beginning of the year, and has sustained, or is able to sustain, an examination upon the studies of the Junior year. In exceptional cases, upon failure in one or two branches only, the examination, as to those branches, may be postponed to some period during the term, and the applicant will be admitted to the class as a candidate for a degree, upon the condition of sustaining a satisfactory examination on those branches at the time appointed for it.

POST-GRADUATE CLASS.

No one will be admitted to such class as a candidate for a degree unless he holds the degree of LL. B. from the Law department of this University; or is a graduate of some other law school, whose course of instruction and study, upon which his degree is predicated, is equivalent to the course of instruction and study required for the corresponding degree in the Law department of this University.

No admission to the Senior or Post-graduate courses will be permitted after two weeks from the commencement of the year.

SPECIAL COURSE.

The same qualifications as to a common-school education and character, required of candidates for the Junior class, will be exacted of students admitted to pursue special courses selected by them.

DEGREES AND HONORS.

Members of the Senior class who have successfully passed the examinations of the Senior year, will be entitled to receive from the Board of Curators the degree of Bachelor of Laws. Members of the Post-graduate course, who have successfully passed the examinations belonging to that course, will be entitled to receive the degree of Master of Laws.

Whenever a candidate for graduation attains a high degree of excellence in his class work, the degree of Bachelor of Laws or Master of Laws will be conferred upon him with distinction, and the words "*cum laude*" will be incorporated in the diploma. In determining the required degree of excellence, the student's conduct as a gentleman, as well as his attainments as a scholar, will be taken into consideration.

Only those Seniors who shall have attained "*distinction*" shall be eligible to the honor of valedictorian at Commencement.

The members of the Senior class are all invited to write essays upon some subject in the law, assigned to them by the Faculty, before January 1 of each year. The essays so written will be submitted to a committee of judges charged with the duty of designating the best two of said essays. The best one of the two thus designated will be read by the author at Commencement exercises, and both of them will be recommended for publication. Students not writing essays as aforesaid shall not be eligible to any of the honors and distinctions heretofore mentioned as in addition to the right of graduation, unless they have been excused therefrom for good cause.

The heirs of the late Hon. James S. Rollins have provided for the establishment of a prize fund, whose interest shall be expended annually in the bestowal of a prize of fifty dollars upon the most worthy Junior in several of the colleges of the University. According to the terms of the trust, one of these prizes is to be awarded to the Junior law student who shows himself entitled thereto by his superior scholarship and moral conduct.

The prize will be awarded at the Commencement following the close of Junior year.

All who receive the degree of Bachelor of Laws are by law admitted, without further examination, to practice in all the courts of the State of Missouri.

TUITION CHARGES AND EXPENSES.

Applicants for admission to any of the classes of the Law department, or as special students to elective courses, are required to pay the sum of fifty dollars for the first year's attendance and forty dollars for each successive year.

Applicants for admission to the Junior class, after January 1st, are required to pay \$35 for the balance of the year. All tuition charges are payable in advance.

No other charges are made by the University, except a fee of \$2 for the diploma given to every graduate by the Board of Curators. No charges are made for certificates of the Faculty given to special students.

Students provide themselves with text-books at their own cost, which will average, for necessary text-books, about \$35 per annum.

A copy of every text-book used in the lecture-room is procured for the Law library, where it may be ready for the occasional use of the students when pursuing their studies there.

Board may be had in clubs at the rate of \$1.75 per week; in families at \$3 to \$4.50 per week.

The Treasurer's receipt should be at once procured and presented to the Proctor of the University by the applicant for admission. His name will then be entered upon the University roll, and a card to that effect will be delivered to him.

The student must present the card thus received from the Proctor to the Secretary of the Faculty, who will enroll his name and issue to him his admission ticket, with instructions necessary for enabling him to have his name entered on the class-roll.

ATTENDANCE.

The attendance in the Law department for the year ending June 2, 1892, numbered sixty-six.

DISCIPLINE.

The Faculty requires every student to pay strict attention to the duties assumed by him, and to be honorable and considerate in his deportment to the Faculty, fellow-students and citizens. This is the only rule of behavior, the highest penalty for violation of which is expulsion.

OPENING AND CLOSING.

The Law department opens on the first Tuesday in October, and closes on the first Thursday in June of each year. The present year ends June 2, 1892. The year next succeeding the present one will open Tuesday, October 4, 1892.

EXAMINATIONS FOR ADMISSION.

Examinations for admission will be held in the lecture-rooms on the first Tuesday of October, at 11 o'clock a. m., and at the same hour on the first day of collegiate exercises after the first day of January, and again on the last Tuesday of January in each year.

Examinations for admission will be accorded at other times upon request, to suit the convenience of applicants.

For information and catalogues, address

ALEXANDER MARTIN, Dean, Columbia, Mo.

XVIII. Medical Department.

[Organized 1845. Suspended during the Civil war. Reorganized 1872.]

FACULTY.

- R. H. JESSE, LL. D.,
President of University.
- A. W. McALESTER, A. M., M. D., Dean of Faculty,
Professor of Surgery and Obstetrics.
- P. SCHWEITZER, Ph. D.,
Professor of Chemistry and Toxicology.
- WOODSON MOSS, M. D.,
Professor of Practice of Medicine and Anatomy.
- GEO. D. PURINTON, M. D., Ph. D.,
Professor of Medical Botany.
- M. L. LIPSCOMB, A. M.,
Professor of Physics.
- J. W. CONNAWAY, D. V. S., M. D.,
Professor of Physiology (Human and Comparative).
- PAUL EVANS, M. D.,
Professor of Histology and Bacteriology.

SPECIAL LECTURERS.

- PAUL PAQUIN, M. D.,
Lecturer on Bacteriology.
- A. B. MILLER, A. M., M. D.,
Lecturer on Gynecology.
- G. R. HIGHSMITH, M. D.,
Lecturer on Abdominal Surgery.
- M. D. LEWIS, M. D.,
Lecturer on Practice of Medicine.
- J. L. CORLEW, M. D.,
Lecturer on Obstetrics.
- F. P. HULEN, M. D.,
Lecturer on Diseases of Women and Children.
- W. A. NORRIS, M. D.,
Assistant Demonstrator of Anatomy.

REQUIREMENTS FOR ADMISSION.

The requirements for admission shall be the same as in the Academic departments. See page 53.

Students are strongly urged to take degrees in Art or Science before entering this department.

COURSE OF INSTRUCTION.

Graded, extending through three years. The 20th annual session will commence September 13, 1892, and will end June 1, 1893, continuing nine months.

The division of studies in the three years' course is as follows:

First Year—Anatomy (osteology and dissecting), Physiology (chemical, nutritive and reproductive), Chemistry, Physics, Normal Histology, Microscopy, with mounting and staining normal tissues; General Therapeutics.

Second Year—Anatomy, general and descriptive, and dissections; Physiology, Nervous System, Chemistry, Microscopy, mounting and staining bacteria; Therapeutics, Theory and Practice of Medicine, Surgery and Obstetrics.

Third Year—Theory and Practice of Medicine, Clinical Medicine, Physical Diagnosis, Surgery, Clinical Surgery; Anatomy, surgical and topographical; Obstetrics, Therapeutics, Gynecology, Diseases of Children; Diseases of eye, ear, nose and throat; Sanitary Science; Medical Jurisprudence; Work in Bacteriological Laboratory.

PLAN OF INSTRUCTION.

Instruction in this school is given by lectures, recitations, clinical teaching and laboratory work.

The length of the session, nine months, renders it practicable to distribute the different branches among the teachers in the most satisfactory manner, and in their natural order and succession. The student is thoroughly drilled each day by examinations upon the lectures of the previous day, and by recitations from the text-books.

By this method of teaching, it is claimed that we avoid the process of cramming—a deleterious practice, too prevalent in the general system of medical education. We believe that the proposed method of teaching will do more to elevate the standard of medical education, and to exalt the dignity of the profession, than any other measure that could be adopted.

Besides the ordinary instruction in chemistry, a special course is given to advanced students in Toxicology, the material and appliances for teaching which are not excelled by any institution in the United States.

The students are also taught the use of the microscope, both in relation to pathological and physiological studies. The methods of bacteriological investigation are taught by practical work in the laboratory. Besides the microscope, the department has the benefit of two superior magic lanterns. For illustrating lectures with the above instruments, there are over 500 slides.

Among the advantages offered by this school is the privilege granted without further cost to all students who enter the Medical department, of pursuing such studies as they may desire in the academic course. Academic students may take Anatomy and Physiology in the medical course, preparatory to entering on the full medical course after graduating in Art or Science. Such students are admitted to the Second year's medical class.

This department is equipped with models in plastic and papier mache, plaster casts, drawings and other appliances for the illustration of the lectures on anatomy, surgery and physiology.

Among the many valuable preparations for demonstrating anatomy and surgery is Dr. Auzoux's Plastic Man, a complete and accurate model of the male human body.

The figure is five feet ten inches in height, and is composed of ninety-two separate parts, which may be detached from one another. It exhibits over two thousand details of the viscera, muscles, nerves, blood-vessels, etc., in short, all that is usually embraced in a complete treatise on anatomy.

Also, Auzoux's female pelvis, with the external organs of generation, the lumbar vertebrae, diaphragm, muscles, aponeuroses of the perineum, vessels and nerves.

Also, his collection illustrating Oology. These models are on an enlarged scale, and exhibit the modification of the ovum, envelopes and vitelline vesicle, etc.

In addition to the above are eight uteri, in plastic, containing the products of conception at the first, second, third, fourth, eighth and ninth months, with examples of tubular and ovarian pregnancy.

Another model, to which we deem it proper to call attention, is Dr. Auzoux's synthetic model of the brain, which exhibits the structure of that organ upon an immensely magnified scale. Designed in conformity with the new anatomical indications furnished by Dr. Luys, this model presents a resume of all the researches of ancient and modern anatomists. This entirely new method of studying the brain opens an immense field for the research of physicians and philosophers. The models of the eye and ear are greatly enlarged and very accurate, showing the complete gross structure of these organs, as described by modern anatomists. The preparation of the head is most admirably executed. The bones are disarticulated and mounted according to the method of Beauchene.

Besides these invaluable models and preparations, we have a complete set of the German anatomical models, in plastic, made at Leipzig.

PRACTICAL ANATOMY.

Every facility is afforded the student for the study of practical anatomy. Adequate provision is made for a supply of subjects amply sufficient for the number of students. The dissecting rooms are large and well ventilated, and will be open during the whole winter season, where, under the guidance of the demonstrators, the student may, by dissection, acquire a practical knowledge of the human body in all parts.

CLINICS.

The number and variety of Medical and Surgical Clinics are ample for the purposes of the highest order of clinical instruction.

DEGREES.

Upon a satisfactory completion of the above course, the degree of Doctor of Medicine will be conferred.

In addition to the ordinary degree of M. D., we recommend the degree of "M. D. *cum laude*" to all students having the degree of A. B. or S. B.

EXAMINATIONS.

Students must pass in the work of each class before admission to an advanced class.

FEES.

The first year's fees, \$20. Second and third years, \$50 each. Diploma, \$2.

REQUIREMENTS FOR GRADUATION.

1. The candidate must have completed and sustained a satisfactory examination upon the course prescribed in this school.

2. He must be twenty-one years of age, and exhibit to the Faculty satisfactory evidence of possessing a good character.

3. His last course of lectures must have been attended in this Institution.
 4. He must have been regular in attendance on lectures and recitations.
 5. He must have pursued the study of practical anatomy, under the supervision of the demonstrator, during his pupilage in this Institution.
 6. He must notify the Dean of the Faculty, on or before the first week of April, of his intention to become a candidate for graduation at the ensuing Commencement.
 7. Every candidate must appear before the members of the Faculty for examination in the various branches of medicine taught in this school, at the time appointed for such examinations.
 8. Violation of the general laws and rules established by the Curators and the Faculty for the government of the University, negligence of duties, habitual and prolonged absence from lectures and from the anatomical rooms, will prevent a student from obtaining a degree.
 9. If a candidate is rejected, his diploma fee will be returned to him.
- For flagrant violation of the rules and laws established for the government of the University, a professional student may be expelled from the Institution. In such a case the fees on his entrance will not be returned to him.

TEXT-BOOKS, AND BOOKS OF REFERENCE.

Anatomy—*Gray*, Wilson, Leidy.
 Surgery—*Ashurst*, Gross, Erichsen.
 Physiology—*Dalton*, Flint, Foster, Kirke.
 Principles and Practice of Medicine—*Flint*, Niemeyer, Watson.
 Materia Medica—*Bartholow*, Biddle, Farquharson.
 Chemistry—
 Obstetrics—*Playfair*, Lusk.
 Diseases of Women and Children—*Thomas*, Smith.
 Histology—*Prudden's* Normal, Rindfleisch's Pathological Histology.
 Pathology—*Ziegler*, Paget, Gross.
 Toxicology—*Taylor*.
 Ophthalmology—*Wells*, Williams.
 Otology—*Toynbee*, Turnbull.
 Medical Jurisprudence—*Taylor*, *Tidy*.
 Nervous Diseases—*Ranney*, Hammond, Reynolds.
 Diseases of the Heart and Lungs—*Flint*, Loomis.

Every student should provide himself with a medical dictionary (*Dunglison's* is suggested). The text-books are designated by *italics*.

All works used as text-books in the school, as well as books of reference, can be purchased here on as favorable terms as in any of the eastern cities.

For any further information in relation to the school, address

A. W. MCALESTER, M. D.,
 Dean of Medical Faculty, Columbia, Mo.

For catalogues, address
 WOODSON MOSS, M. D.,
 Secretary Medical Faculty, Columbia, Mo.

ENROLLMENT.

First year's class	27
Second year's class	5
Third year's class	

NOTE.—The adoption of the "Three Years' Course" accounts for no graduating class this year.

XIX. Department of Engineering.

FACULTY.

- R. H. JESSE, LL. D.,
President of the University, Ex Officio Chairman of the Faculty.
- THOMAS JEFFERSON LOWRY, S. M., C. E., DEAN,
Professor of Civil and Topographical Engineering.
- PAUL SCHWEITZER, Ph. D.,
Professor of Chemistry.
- E. A. ALLEN, Litt. D.,
Professor of English.
- WILLIAM B. SMITH, Ph. D.,
Professor of Mathematics and Astronomy.
- Lieut. B. B. BUCK (detailed from Regular Army),
Professor of Military Science and Tactics.
- G. C. BROADHEAD, M. S.,
Professor of Geology and Mineralogy.
- M. L. LIPSCOMB, A. M.,
Professor of Physics.
- HIRAM PHILLIPS, Top'l Engineer,*
Assistant Professor of Engineering.
- WILLIAM SHRADER, Ph. D.,
Assistant Professor of Physics.
- C. W. MARX, B. E.,
Superintendent of Shop-work in Department of Mechanic Arts.
- ALEXANDER MAITLAND, C. E.,
Assistant Professor of Civil Engineering.

* Resigned January 23, 1892.

GENERAL STATEMENT.

The School of Engineering is designed to furnish the students the means of acquiring a thorough knowledge, theoretical and practical, of those sciences and arts which are playing the most important parts in the development of the material resources of our country, and the advancement of our civilization.

The advances in scientific and technical education made in the last twenty years have been largely in the direction of the introduction of a certain amount of laboratory and practical training into courses of study which formerly consisted exclusively of text-books and theoretical work. The results of this innovation have been so satisfactory that it is no longer a question of debate. To this end it will be observed that shop-work, field-work, laboratory practice and drawing are made prominent features of the Engineering courses.

The sphere of the engineer is so broad and diversified that it is impossible for anyone to become proficient in all the various specialties into which the profession has been so divided. To meet the demands for special engineering studies and training from the end of the second year of the studies laid down in the Engineering Synchronistic table, three parallel courses have been arranged, (see page 99), so as to allow of option and diversity of special studies. This department will thus foster the development of special fitness in each student, by offering him work in the line of his preferences. These courses are:

I—Civil Engineering.

II—Hydraulic and Topographical Engineering.

III—Electrical Engineering.

The course in Civil Engineering is designed for those who wish to make either road engineering, or railroad engineering, or the designing and construction of bridges and masonry, a specialty.

The course in Hydraulic and Topographical Engineering is arranged for those students who wish to make either geodesy, or irrigation, or water-works, or dams and foundations, or river improvement, a specialty.

The Electrical Engineering course has been established to meet the wants of young men desirous of entering upon the rapidly developing field of the applications of electricity to the arts. Its leading studies are physics, especially theoretical and applied electricity, mechanics, mathematics and chemistry. The course is made strong in shop-work, mechanical engineering and mathematics, because in many branches of electrical engineering a sound and practical knowledge of mechanics, measurements of power and its transmission is essential.

We especially ask the attention of those young men who desire to fit themselves for the duty of county surveyor and of government land surveyor to the fact that every effort will be made to enable them to accomplish this within a short time. To this end, at the beginning of each year, a class will be organized and instructed (theoretically and practically) in land surveying, with compass, theodolite and solar compass; in the surveys for and location and construction of roads, and in the surveys for and location of, and in the designs for and construction of, wooden bridges, and in locating and surveying base lines, meridians, and township and section lines, and in retracing old government, township and section lines. This class will also be instructed in drawing. This course can be completed in forty weeks. A certificate of proficiency will be given those who complete this course.

INSTRUCTION IN ENGINEERING.

The methods of instruction embrace the use of text-books, lectures (illustrated by diagrams of the great engineering and surveying operations and results of the present age), and actual field and observatory practice. The field and observatory practice and work in the chart-room are made to bear a large proportion to the theoretical instruction. The data thus obtained by actual field surveys and practice in the shops, laboratories and the observatory serve both to elucidate the principles and formula, and insure their ready and accurate application in professional life.

TECHNICAL ENGINEERING WORK.

CIVIL ENGINEERING.	HYDR. AND TOP'L ENG'R.	ELECTRICAL ENG'R.
<i>Junior, First Semester.</i>	<i>Junior, First Semester.</i>	<i>Junior, First Semester.</i>
App. Mech..... 4 Des. Geom..... 4 Diff. Calculus..... 3 Int. Calculus..... 2 Drawing..... 3 Shop (forg. iron and steel). 2	Des. Geom..... 4 Diff. Calculus..... 3 Int. Calculus..... 2 Drawing..... 4 App. Mech..... 5	Physics..... 4 Analyt. Mech..... 4 Calculus..... 5 Shop or Drawing..... 2 French or German..... 3
<i>Second Semester.</i>	<i>Second Semester.</i>	<i>Second Semester.</i>
App. Mech..... 4 Des. Geom. and Draught'g 5 Higher Surveying..... 5 Physics..... 2 Shop (forg. iron and steel). 2	Des. Geom. and Draught'g 3 Higher surveying..... 5 Steam Engine..... 3 Hydr. Sur. and Pr. Astr.. 2 Drawing..... 2 Geodesy..... 3	Physics..... 4 Chemistry..... 3 Calculus..... 5 French or German..... 3 Elec. and Magnetism..... 3
<i>Senior, First Semester.</i>	<i>Senior, First Semester.</i>	<i>Senior, First Semester.</i>
R. R. Sur. and Eng'r... 4 Strains in Fr. Structures.. 5 Masonry Construction.... 4 Eng'r Test. Laboratory... 1 Shop (clipping, filing and fitting)..... 2 Tech. Drawing..... 2	Irrigation..... 2 Least Sqrs..... 2 Top'l Mapping and Field-work..... 3 Hydraulic Eng'r Rivers and Harbors... 5 Foundations and Dams... 3 Drawing..... 3	Electro-dynamics..... 3 Applied Mechanics..... 4 French or German..... 3 Dynamo-Elec. Machinery. 4 Physical Laboratory..... 2 Chemical Laboratory..... 2
<i>Second Semester.</i>	<i>Second Semester.</i>	<i>Second Semester.</i>
Designing Structures, Project and Thesis..... 5 Steam Engine..... 2 Field-work..... 3 Eng'r Spec. and Contracts 2 Eng'r Test Laboratory... 1 Shop (clipping, filing and fitting)..... 2	Water-works..... 5 Sanitary Eng'r..... 5 Drawing..... 3 Eng'r Spec. and Contracts 2 Project and Thesis..... 3	Tech. App'n of Electricity 3 Applied Mechanics..... 4 Machine Design..... 2 Steam Engine..... 2 Orig. Research and Thesis 5

ACADEMIC WORK

Required for Graduation in the Courses in Civil, Hydraulic and Topographical, and Electrical Engineering.

CIVIL ENG'R AND HYDR.
AND TOP'L ENG'R.*Freshman, First Semester.*

Algebra, Geom. and Trig.	5
Chemistry	4
English	3
Drawing	4
Shop (Joining & Carp'try)	2

Second Semester.

Algebra, Geom. and Trig.	5
Chemistry	4
Land Surveying and Law	4
English	3
Drawing	1
Shop (Carp'try & Joining)	1

Sophomore, First Semester.

Analytical Geometry	3
Mineralogy	4
Roads, Streets & Pavem'ts	2
Elementary Mechanics	4
Drawing	2
Field Work	1
Shop (Wood Turn'g, Patt. Making and Moulding)	2

Second Semester.

Economic Geology	2
Analytical Geometry	4
Physics	4
Chemistry	3
Drawing	3
Shop (Wood Turn'g, Patt. Making and Moulding)	2

ELECTRICAL ENG'RING.

Freshman, First Semester.

Algebra, Geom. and Trig.	5
Chemistry	4
Shop	2
German or French	3
Drawing	2
Comp. and Rhetoric	2

Second Semester.

Algebra, Geom. and Trig.	5
Chemistry	4
Shop	2
German or French	3
Drawing	2
Comp. and Rhetoric	2

Sophomore, First Semester.

Descrip. Geometry	2
Analytic Geom. and Det.	3
Mineralogy	4
German or French	3
Drawing	2
Shop	2
English	3

Second Semester.

Physics	4
Analytic Geometry	4
French or German	3
Shop	2
Drawing	2
Elec. Measurements and Problems	3

Special Course in Elec-
trical Engineering
Of two years, ending with
Certificate.*Freshman, First Semester.*

Chemistry	4
Comp. and Rhetoric	2
Geom., Trig. and Algebra	5
Drawing	2
Shop	2
Arithmetic of Elec. Meas- urements	4

Second Semester.

Chemistry	4
Comp. and Rhetoric	2
Geom., Trig. and Algebra	5
Drawing	2
Shop	2
Physics (from Soph.)	4

Sophomore, First Semester.

Physics (Junior)	3
Electro-dynamics	4
Drawing	3
Shop	5
Physical Laboratory	2
Electrical Laboratory	2

Second Semester.

Technical Application of Electricity	3
Steam Engine	2
Machine Design	2
Drawing	2
Shop	3
Chem. Lab'tory (Junior)	3
Electrical Laboratory	4

NOTE.—While the student is pursuing the first three years of the Engineering courses, the tuition is \$20 per year; the last two years, \$40 per year.

"The James S. Rollins Engineering scholarship" of \$50 will, on the first day of June of each year, be awarded to that member of the Junior class in Civil Engineering "who shall be adjudged entitled to it by the President and the Faculty." For conditions of award, see article: "James S. Rollins University Scholarships," page 110.

REPORT.

The following is the report of the Engineering department for the year ending June, 1892:

Senior class	3
Juniors, Sophomores and Freshmen	49
Total in the Engineering course	52
Candidates for certificate of surveyor	6
Total number in the Drawing classes of Engineering School	28

The classes in topographical surveying and engineering have, by frequent practice in the field, familiarized themselves with the use of the theodolite, sextant, spirit and water-levels, leveling rods, chain and compass, and plane-table. And the class in surveying, by frequent practice in the field, have familiarized themselves with the use,

manipulation and capabilities of the theodolite, compass and chain, and leveling rods and spirit levels, and the solar compass.

The energy, enthusiasm, painstaking care and accuracy displayed by these classes have confirmed me in the opinion previously formed from observation and experience of seven years with field officers of the U. S. Coast survey and navy, that the American mind possesses a fertility of resources, a power of adapting means to ends, and an acuteness of perception, which peculiarly fit it for an observer in the exact arts.

The wisdom of the Board of Curators in providing an assistant professor of Engineering to devote his entire time to work in the Engineering school, is shown in the increased efficiency of the engineering students in drawing-room and field-work

The fact that we have been able to secure positions (on the surveys and improvements of the Mississippi and Missouri rivers, on the coast survey, on railroad surveying and engineering parties, on bridge engineering, and on government land surveying parties) for the graduates from this department, has assisted materially in awakening an intelligent interest—a healthy enthusiasm—in the cause of engineering education at this University. And the present revival in the industries which demand engineering, electrical and chemical skill has already increased and promises to further increase the number of students in this department.

THOMAS J. LOWRY,
Dean of Engineering School.

XX. Military Department.

Lieutenant B. B. BUCK, 16th U. S. Infantry,
Professor of Military Science and Tactics, and Commandant of Cadets.

During the year now drawing to a close, 193 cadets have received instruction in this Department. The Cadets are organized in a battalion of four companies, a band and an artillery detachment, as follows:

<i>Battalion Staff and Non-Commissioned Staff.</i>	
Cadet First Lieutenant and Adjutant	J. J. Duncan.....
Cadet First Lieutenant and Quartermaster	F. W. Niedermeyer....
Cadet First Lieutenant and Ordnance Officer.....	A. S. Holmes.....
Cadet Sergeant Major	O. W. Granger.....
Cadet Quartermaster Sergeant	J. N. Fellows
Cadet Drum Major.....	C. Truitt
<i>Company A.</i>	
Cadet Captain	S. F. Crecelius.....
Cadet First Lieutenant	E. T. Allen.....
Cadet Second Lieutenant	T. W. Thompson.....
Cadet First Sergeant.....	H. G. McBurney.....
<i>Company B.</i>	
Cadet Captain	C. G. Haines.....
Cadet First Lieutenant	(Vacancy)
Cadet Second Lieutenant.....	F. D. Wickam
Cadet First Sergeant	K. Stone.....
<i>Company C.</i>	
Cadet Captain	A. J. McCulloch.....
Cadet First Lieutenant.....	J. E. Smith.....
Cadet Second Lieutenant.....	W. E. Gordon
Cadet First Sergeant	H. M. Dawes.....
<i>Company D.</i>	
Cadet Captain	J. P. White.....
Cadet First Lieutenant.....	H. B. Walker.....
Cadet Second Lieutenant.....	J. E. Bishop.....
Cadet First Sergeant	J. M. Allen.....
<i>Artillery Detachment.</i>	
Cadet Captain	H. L. Moore
Cadet First Sergeant.....	H. R. Mitchell.....

Those Cadets are appointed to office who show ready obedience, zeal and capacity in the discharge of military duty. The Governor of Missouri issues commissions to those entitled by their battalion rank to receive them.

GENERAL SUPPLIES.

One hundred and fifty Springfield cadet rifles of the latest model, one Gatling gun, cal. 45, with full equipment, two 3-inch rifled field-guns, with carriages and implements, and a suitable amount of ammunition and target materials are furnished by the United States. The State supplies ammunition, camp equipage, utensils, etc.

UNIFORMS.

Cadets wear but one style of uniform, known as the undress, or fatigue, uniform. Uniforms must be worn at all military exercises, and may be worn on all occasions. Tailor-made uniforms are supplied to volunteer cadets at a cost of \$16.50 each, including cap and gloves. The State furnishes uniforms to regularly appointed cadets free of cost. The 36th General Assembly made for this department a special appropriation of \$5,000, which is used to provide uniforms. These uniforms are of the very best material and make.

COURSE OF INSTRUCTION.

FIRST YEAR—SECOND CLASS.

Practical instruction in the Schools of the Soldier, Company and Battalion (infantry), and Extended Order.

Practical instruction in rifle firing, 100, 200 and 300 yards.

Practical instruction in duties of camp, embracing guard duty, etc.

Recitations in Infantry Drill Regulations through School of the Company, ceremonies of Guard Mounting, Dress Parade, Inspection, Review, Muster and Extended Order.

Recitations in guard duty, rifle firing and cadet regulations.

SECOND YEAR—FIRST CLASS.

Practical instruction in the Schools of the Company and Battalion, and in Extended Order.

Practical instruction in the service of field-guns (foot battery), with mechanical maneuvers.

Practical instruction in rifle-firing, 100, 200 and 300 yards.

Practical instruction in the duties of camp, embracing guard duty, etc.

Practical instruction in military signaling.

Recitations in Infantry Drill Regulations. School of the Battalion.

Recitations in Artillery Tactics, manual of the piece dismounted.

Recitations in the elements of Field Fortifications.

Recitations in the elements of the Art of War.

Lectures on Army Organization, the Army of the U. S., the Regulations of the U. S. Army, the Regulations of the National Guard of Missouri, Courts-Martial and Military Law and the Customs of War, Street Fighting, etc.

No cadet is excused from recitations, lectures, drills, camp or other duty now prescribed, or to be ordered as circumstances may render necessary, except as provided for in the cadet regulations.

All cadets who have *satisfactorily passed* the first year's course constitute the first class. All others constitute the second class.

CERTIFICATE OF PROFICIENCY.

To have passed through the entire course does not entitle a cadet to receive a certificate of proficiency in military science and tactics, but it is the rule now adopted in the department that the certificate will be issued to every cadet, State or volunteer, who takes the entire course and attains the second grade (at least 70 per cent) in *every examination* during the two years.

APPOINTMENT OF STATE CADETS.

The following extracts from the Militia law of the State of Missouri, enacted by the Thirty-fifth General Assembly, and now in force, will be of interest to those who desire to receive the appointment as cadet :

SEC. 5. The Military department of the University of the State of Missouri, as organized under section 1225, Revised Statutes of the United States, and section 7279, Revised Statutes of Missouri, 1879, is created the Missouri State Military School.

SEC. 6. The corps of cadets at the Missouri State Military School shall consist of one from each senatorial and representative district in this State, and shall be actual residents in the district from which appointed, and shall pass the required examination for admission to the University. Each Senator and Representative of the General Assembly of the State of Missouri shall appoint during the month of August in each year a cadet for such scholastic year.

SEC. 7. Cadets receiving instruction as provided in the preceding section shall be matriculated in all the academic departments of the University free from tuition fees, and subject only to the incidental fees and laboratory fees therein provided.

SEC. 8. The corps of cadets as provided in the preceding sections shall have the military organization prescribed for the National Guard of the State and reckoned a part thereof, and as such entitled to all such provisions as are or may hereafter be made for the National Guard of Missouri. The military government and discipline of the cadets shall be prescribed by regulations prepared by the Faculty of the University and approved by the Governor of the State.

A circular letter of instructions will be prepared and forwarded to Senators and Representatives prior to August 1, 1892, setting forth the conditions of entrance and inviting them to make appointments under this law. No cadet will be received who is under 16 or over 25 years of age, or who is less than five feet one inch in height, or who is in any way physically disqualified for military service. Although the law is silent on the subject, and each Senator and Representative must be his own judge in the matter, still it is desirable that appointments be made by competitive examinations, since the State, after making liberal provisions, is entitled to the very best material obtainable.

All male students of the University not physically disqualified, and who come within the limits of age and height, will be allowed to enroll themselves as voluntary cadets, but State cadets only will be matriculated in Academic departments of the University free of tuition, and provided with uniforms without expense to themselves. A copy of the regulations for the government of cadets will be given to each cadet upon his entrance into the Missouri State Military School. These regulations require cadets to enter and report to the commandant for duty *before* September 25th of each year. They should report by September 8th, if possible.

Cadet regulations prescribe that military drills, etc., shall be held at least three hours each week, one of which shall be for theoretical and two for practical instruction. The regulations also require an annual encampment of from eight to ten days, during which time the instruction is entirely military and practical. Here the cadets are put through all the duties of camp life. They conduct their own commissary and quartermaster departments. They have target practice at 100, 200, 300 and 400 yards, and perform the duties of sentinels, patrols, etc., and are given all the drills and ceremonies prescribed in the two years' course. The expenses of the camp are borne by the University.

B. B. BUCK, U. S. Army,
Professor of Military Science and Tactics.

XXI. Department of Art.

Professor ————.

UNIVERSITY LIBRARY.

Since our last (fifteenth) Annual Report, we have sustained the loss, by fire, of the University library. Only such books as happened to be out of the main building at the time were saved, and these numbered about 200. With the books, went down all the pictures, statuary, etc. But the courage of the Curators, Faculty, students and friends of the University was superb, so that in the face of calamity an effort was instantly made to retrieve our losses. As the news of the fire spread over the country, publishers, universities, libraries and private individuals came to the rescue with gifts and loans. The Curators have promptly furnished us with commodious quarters in the Medical building, and already books are pouring in. We have \$10,000 insurance money on books, which will be available in a short time to make purchases for our next school year, and this will form the nucleus of even a better library than the one burned. Our Sixteenth Annual Report is as follows:

	Books.	Pamphlets
General library	1,551	
*Destroyed by fire.....	900	
Law library.....	1,764	
Total.....	4,155	912

* Law books, to be replaced by July 1, 1892.

The thanks of the University are due to many persons for gifts of books, pamphlets and periodicals. The Wisconsin Historical Society and Wisconsin University have kindly remembered us. Their box of books did not arrive in time, however, to specify the contents. Several Missouri authors have generously placed copies of their works in the library—some, alas! previous to our disastrous fire. A list of donors is submitted below.

DONATIONS TO UNIVERSITY LIBRARY.

Donors.	Vols.	Donors.	Vols.
†United States government	1,342	J. W. Buel	5
Johns Hopkins University	187	R. E. Downing.....	5
Michigan University	165	Charles Scribner's Sons.....	4
Major J. B. Merwin.....	100	Cupples, Upham & Co	4
Ginn & Co.....	25	State Geologist.....	4
MacMillan & Co.....	15	Public Opinion Co.....	3
Dr. Duncan.....	51	Rev. Dr. Watts.....	3
State government	42	Bureau of American Republics	3
World's Exposition	26	Mrs. J. J. Sperry	2
L. M. Defoe	21	Captain Rollins.....	2
F. Hindekoper.....	15	Dr. W. B. Smith.....	2
W. W. Garth.....	15	Mrs. Kate West	1
Harper Bros	14	P. Cudmore.....	1
American Hereford Association	14	Eli Oppenheimer	1
American Holstein-Friesian Ass'n.....	14	James Reed	1
American Short-horn Ass'n.....	14	Mr. Rozier	1
Houghton, Mifflin & Co	8	J. K. Smith.....	1
Pub. of North American Review.....	6	John Smith.....	1
D. Appleton & Co.....	6	Dr. A. L. Branstetter.....	1
The Century Co.....	6	John Boulton.....	1
W. M. Scott	6		
Rev. Geo. A. Watson.....	5	Total	2,103

† Special mention is made of the Hon. John T. Heard, member of Congress, for his indefatigable labors in this behalf.

Thanks are due Prof. J. K. Hosmer for the gift of five books of his own production.

PERIODICALS PRESENTED TO THE LIBRARY.

American Economist.....	Merck's Medical Bulletin
Apostolic Guide	Mexico Intelligencer.....
Centralia Courier.....	Mexico Ledger.....
Central Baptist.....	Mid-Continent.....
Colman's Rural World.....	Monroe City News.....
Columbia Herald.....	National Economist.....
Columbia Statesman.....	Post-Dispatch.....
Cooper County Democrat	Saline County Progress.....
Cynosure.....	San Jose Herald.....
Hannibal Daily Journal.....	Shelbina Democrat.....
Judge.....	St. Joseph Herald.....
Kansas City Live-Stock Indicator.....	St. Joseph Gazette.....
Knox County Democrat.....	The Voice.....
Medical Mirror.....	Weekly Democratic News.....

PERIODICALS PURCHASED FOR CURRENT YEAR.

Academy (Boston)	Journal of Hellenic Studies
Academy (London)	Journal of Royal Microsc. Society (London).....
Agricultural Science Monthly	Journal of Society of Natural History.....
Albany Law Journal	Journal of Chemical Society (London).....
American Antiquarian	Kansas City Times (Daily).....
American Naturalist.....	Kansas City Journal (Daily).....
American Journal of Science.....	Kansas City Star (Daily).....
American Journal of Mathematics.....	Ladies' Home Journal.....
American Journal of Philology.....	Leslie's Illustrated Weekly.....
American Microscopical Journal.....	Lippincott's Magazine.....
American Law Review.....	London Quarterly.....
American Geologist.....	Magazine of American History.....
American Garden.....	Medical Journal (New York).....
Andover Review.....	Modern Language Notes.....
Annals of Mathematics.....	Nation.....
Arena.....	National Guard.....
Atlantic Monthly.....	New England Magazine.....
Century Magazine.....	Nineteenth Century.....
Chautauquan.....	North American Review.....
Chemical News (London)	Poet Lore.....
Christian Union.....	Political Science Quarterly.....
Classical Review.....	Popular Science Monthly.....
Critic.....	Public Opinion.....
Eclectic Magazine.....	Quarterly Review (London).....
Edinburgh Review.....	Review of Reviews.....
Education.....	Revue des Deux Mondes.....
Educational Review.....	Rhenisches Museum für Philologie.....
Electrical Engineer.....	Sanitarian.....
Electrical World.....	Scientific American.....
Engineering and Mining Journal.....	Scientific American Supplement.....
Engineering News.....	Scribner's Magazine.....
Forum.....	Shakspeariana.....
Globe-Democrat (Daily).....	St. Louis Republic (Daily).....
Harper's Magazine.....	Sunday School Times.....
Harper's Weekly.....	Trubner's Oriental Record.....
Hebraica.....	University Magazine.....
Hermes Zeitschrift.....	University Extension Magazine.....
Independent (New York).....	United Service.....
Journal of Education.....	Youth's Companion.....

Members of the Faculty are permitted to take books out of the library, each being entitled to six volumes, for one week.

Any student who deposits the value of the book is permitted to take it out for University work, over night.

The reading room is open during the school year, excepting Sundays and legal holidays—in winter from 7:45 a. m. to 5 p. m., and in summer until 6 p. m.

Students are expected to be in the library at work if not at recitation, or at their residences, during school hours.

The Librarian and his assistant make a study of the contents of the library, so as to render valuable assistance in selecting matter for the use of the students.

J. W. MONSER,
Librarian.

MISCELLANEOUS.

DIRECTIONS FOR NEW STUDENTS.

1. If assistance is desired in obtaining board, report to the Proctor at the University buildings.

2. New students will first present themselves to the President, who will issue to them a card of admission to the examinations. This should be done *before paying tuition fees*. Examinations for admission will be given by the English and Mathematical and Agricultural departments on Thursday, Friday, Saturday and Monday, September 8th, 9th, 10th and 12th, preceding the opening of the University.

3. After passing entrance examination, \$15.00 must be paid to the Treasurer, and his receipt obtained. The law student pays upon entrance \$50.00 the first year; \$40.00 the second year. The medical student pays upon entrance \$20.00 for the first year; for the second year \$50.00; for the third year \$50.00. This includes the demonstrator's ticket. Engineering students in the professional courses pay upon entrance \$40.00 for the first year; for the second year \$40.00. Agricultural students pay upon entrance \$10.00 in lieu of all other charges.

4. The Treasurer's receipt should be at once presented to the Proctor, when the name of the student will be entered upon the University roll.

5. The academic and professional students must present the card received from the Proctor to the Secretary of the Faculty, who will enroll his name and issue to him his matriculation ticket, with the instructions necessary for enabling him to have his name entered on class roll.

6. Students in the College of Agriculture and Mechanic Arts must present the matriculation card to the Dean of the Faculty in Agricultural hall, who will enroll their names with the necessary instructions to enable them to have their names entered on the class rolls.

RELIGIOUS WORSHIP.

Religious exercises are held every morning from 8:45 to 9 o'clock in the chapel. They consist of readings from the Old and the New Testaments, a brief prayer, and a song by the choir. All students and professors are required to attend these exercises.

STUDIES AND CHAPEL.

1. Academic students are expected to have not less than fifteen nor more than twenty hours per week with the Faculty at lectures or recitations. Class-cards, when once filed with the Secretary, can be changed only by Faculty action.

2. Prompt attendance and orderly conduct at the daily devotional exercises in the University chapel are required of every student in the University.

3. Absences from chapel, as from town, are permitted or excused by the President, or, in his absence, by the Chairman of the Faculty. Class absences are recorded. Excuses are to be rendered to the Professor.

EXAMINATIONS AND CLASS HONORS.

1. Examinations at the end of each semester close the studies pursued to that point. Re-examinations for substitution of grades are not allowed after the lapse of one scholastic year.

2. Only those Academic Seniors who shall have attained "first rank with distinction" shall be eligible to election as valedictorian at Commencement. If more than one Senior shall have attained "first rank with distinction," then the class selects from such students the valedictorian. Otherwise, that student having the highest grade becomes *ipso facto* the valedictorian of the class.

3. All special examinations are in the discretion of the heads of departments.

DEGREES.

The following degrees are now conferred by the University:

In the Academic department, A. B. (Bachelor of Arts), L. B. (Bachelor of Letters), and S. B. (Bachelor of Science).

In the Law department, LL. B. (Bachelor of Laws), and LL. M. (Master of Laws).

In the Engineering department, C. E. (Civil Engineer), Top'l Eng'r (Topographical Engineer), E. E. (Electrical Engineer) and M. E. (Mining Engineer).

A course in Mechanical Engineering will soon be offered, leading to the degree of Mechanical Engineer.

In the Agricultural College, B. Agr. (Bachelor of Agriculture), M. Agr. (Master of Agriculture).

In the Normal department, Pe. B. (Bachelor of Pedagogics).

In the Medical department, M. D. (Doctor of Medicine).

In addition to the above, the usual Master's degree and the degree of Ph. D. are conferred upon the completion of sufficient post-graduate work.

Except that of LL. D., no degree is conferred in course or *honoris causa*.

CERTIFICATES.

A certificate in surveying is granted by the Engineering department, one in Pedagogics by the Normal department, and one in the two-year course in College of Agriculture; also one in the Military department.

DISCIPLINE.

The rules for the government of students are published in pamphlet form, and may be had on application to the Librarian. Every student is expected to procure a copy immediately on his entrance.

FEES AND EXPENSES.

Annual entrance fee \$10; Library and incidental fee, per semester, \$5: that is, the student who enters the first semester pays \$15, and for the second semester only \$5, having paid his entrance fees for the year, upon admission. If he enters the second semester he pays \$15: *i. e.*, entrance and semester fees.

Engineering students are charged \$40 a year, to be paid upon entrance. This includes the incidental fee. Medical students pay \$20 for first year, \$50 for second year and \$50 for third year, to be paid upon entrance. Law students pay \$50 first year; \$40 second year. This includes the incidental fee, and must be paid upon entrance. Agricultural students pay \$10 upon entrance in lieu of all other charges.

For laboratory fees, see report of department concerned.

The fee for diplomas is \$2; for certificates, \$1. Payment must be made to the Treasurer of the University, and his receipt handed to the Secretary of the Faculty, before the name is recommended to the Curators for the degree.

RESIDENT GRADUATES.

It is hereby resolved by the Board of Curators, That hereafter all regular graduates in any department of the University, and every regular graduate of the Normal Schools established by law within this State, also all regular graduates of "Christian Female College" and "Stephens Female College," located in Columbia, and the graduates of all other regularly chartered literary and scientific colleges in this State, with regular college classes established therein, and that are authorized by law to confer degrees and to grant diplomas to their students, shall be entitled to enter all the departments of the State University, including the Mining department at Rolla, as Post-graduates, free of the payment of tuition fees, and to receive instruction in the same manner as other students in the Practical, Literary and Scientific departments or classes (and all subjects taught in the University), and which they may choose to enter: Provided, however, that neither Law nor Medical students are included in this resolution; and also, that they may have full access to the Library of the University, with all other students, on such terms and under such rules as may be prescribed by the Executive committee. (The Engineering School is also excepted.)

A fee of \$5 per semester for incidental fees is charged.

It is the understanding of the Faculty, that whilst resident graduates thus admitted are to be allowed optional attendance on the classes, without being required to recite, unless it be as a condition of acquiring a class standing, yet otherwise they are to be subject to all the rules of behavior and discipline of under-graduates.

MINISTERS AND STUDENTS PREPARING FOR THE MINISTRY.

Resolved by the Board of Curators of the University of the State of Missouri, That hereafter all regularly ordained ministers of the Gospel belonging to any of the various religious denominations of this State in good standing, and who may desire to improve their scholarship and moral and intellectual culture, shall be allowed to attend any of the schools of the University without the payment of tuition fees, except the schools of Law, Medicine and Civil Engineering—the same privilege to be extended to any young man in this State preparing for the ministry, who will submit testimonials that shall be satisfactory to the President and Faculty of the University, that he is in good faith a candidate for the ministry, and that he is unable to meet the expenses of education at the University without aid.

Adopted June 2, 1880.

For graduate of highest rank from "approved" High Schools see page 59.

BOARDING.

Board in private families, with lodging, washing and fuel, may be obtained for \$3 to \$4 50 a week. Those who enter the club may reduce this amount to \$1.75.

THE CLUB-HOUSES.

The club-houses afford accommodations for 125 students. The room rent for each student is \$10, payable in advance, on or before the first day of September. The cost of board, room-rent, fuel and washing, to those who enter a club, is about \$1.75 per week. Each room is furnished with bedstead, stove, table and two chairs. Occupants are expected to furnish whatever else they deem necessary.

The members of the club have their own officers—president, commissary, secretary, censors, etc. They levy and collect assessments and buy their own provisions.

THE JAMES S. ROLLINS UNIVERSITY SCHOLARSHIPS.

In 1889, the Hon. James S. Rollins left six thousand dollars (\$6,000) to endow six scholarships in the University—"the interest" on this \$6,000 "to be forever used and appropriated under the authority and by the direction of the Board of Curators of the University of the State of Missouri for the following purposes, that is:

"To found scholarships to be awarded by the President and Faculty of the University—the vote in each case to be by ballot—as a reward for excellence and promise in—

"*First*—The College of Arts, for the degree of A. B., fifty dollars.

"*Second*—The College of Arts, for the degree of B. S., fifty dollars.

"*Third*—The College of Agriculture and Mechanic Arts, degree of B. Agr., fifty dollars.

"*Fourth*—The College of Law, for the degree of LL.B., fifty dollars.

"*Fifth*—The College of Medicine, for the degree of M. D., fifty dollars.

"*Sixth*—The College of Engineering, for the degree of C. E., fifty dollars.

"These scholarships are intended as a recognition of merit and character in the beneficiaries, and shall be payable on the first day of June of each year to that member of the *Junior class*, in each of the colleges designated, who shall be adjudged entitled to it by the President and Faculty; and the names of the persons receiving said scholarships shall be publicly announced on Commencement day by the President of the University.

"In according these scholarships, it is earnestly impressed upon the President and Faculty of the University, that in the mind of the donor, purely intellectual and literary ability are not alone to be considered, but that the moral character of the contestants should be regarded as a factor of no small weight in coming to a decision.

"With the earnest hope that by the means here provided, worthy young men and women may in all coming time be helped and encouraged in their struggle toward a higher life and greater usefulness, this fund is committed to the honor and good faith of the State, whom the Board represents, and by whose authority the donation is made and accepted.

I am very respectfully,

(Signed)

JAMES S. ROLLINS."

ROLLINS AID FUND.

[Extract from the will of Anthony W. Rollins, M. D., dated 1843, and probated December 10, 1845. Prob. Record, Book B, pp. 743-4.]

Item 7.—Having felt the great disadvantage of poverty in the acquisition of my own education, it is my will that my executors, hereinafter named, shall, as early after my death as they may deem most expedient, raise the sum of ten thousand dollars by the sale of any lands of which I may die seized, and which I have not specifically bequeathed in any of the foregoing items, which sum of ten thousand dollars I desire may be set apart for the education of such poor and indigent youths of Boone county, both male and female, as are unable to educate themselves.

Item 8.—When my executors shall have raised the sum of ten thousand dollars in the manner specified above, it is my will that they pay over the same to Alexander Persinger, Gilpin S. Tuttle and James W. Dailey, justices of the county court of Boone county, or their successors in office, who may compose the county court of Boone at the time, and that said fund shall remain with and be vested in said court as a permanent fund, for the promotion of the object specified in the seventh item of this will above.

Item 9.—It is my will that the judges of the county court shall loan out the fund thus vested in them, at an annual interest of ten per centum per annum, and in every instance upon good personal security, with mortgage upon real estate at least in value to the sum loaned, and in such manner as will insure the payment of the interest thereon at the expiration of each year; it is my will, further, that three-fourths of the interest thus annually accruing shall be set apart, or so much thereof as may be necessary, to pay tuition of

such youths as may have entered the Columbia Female Academy or the State University, under the provisions hereinafter named; and the one-fourth of the interest thus annually accruing, and so much of the remainder as shall not have been appropriated for any one year as above, shall be annually added to and become a part of the permanent fund.

Item 10.—It is my will that the President of the State University of Missouri, and the Principal of the Columbia Female Academy, shall in each year visit the common schools of the different neighborhoods of Boone county, and select from among the indigent boys and girls of the different schools or neighborhoods such of them as are inclined to avail themselves of the advantages of the fund set apart as above, always having reference in their selection to the moral and intellectual qualities of the youths above; and further, that the President, at each annual Commencement of the University, shall direct the public attention to this subject, invite the citizens who may be present to subscribe by way of enlarging the fund from year to year thus appropriated to the education of the poor; and, further, that in selecting boys as above, preference may be given to such as evince an inclination to preach the gospel.

As the Columbia Female Academy has ceased to exist, it is the duty of the President of the University "to select" the beneficiaries as students of the University. (Item 10.) This choice is regulated by several circumstances, as that—

1. The beneficiaries must belong to Boone county, in good faith and not merely nominally. (Items 7 and 10.)

2. They may be "either male or female," but must be needy: *i. e.*, "unable to educate themselves." (Item 7.)

3. Regard must be had to "moral and intellectual qualities." (Item 10.) Hence, (a) preference will be given to such as show superior capacity, whether in the University classes or in the schools; and, perhaps, a system of examinations might aid in the wise and impartial determination of the choice. Hence, also, (b) aid from this fund will, in all cases, be withdrawn from students who incur college discipline, or who fail to maintain a reputation for exemplary conduct and scholarship. The incurring of marks of demerit may be considered such discipline, and falling below the required standard of scholarship, in any study, such failure. Disorderliness in a beneficiary is an aggravated offense, and any part of an apportionment not paid may, on that account, be recalled at any time.

4. Whilst aid is not limited to tuition (Item 7), it is plainly first in the contemplation of the benefactor. (Item 9.) This fund, therefore, has in it the virtue of strengthening the University, whilst it provides for the specific and legitimate exercise of its educational functions, in the interest of the needy, in its own immediate locality.

The will does not provide at whose direction, nor in what sums, the money is to be apportioned, and this, therefore, is left to the good understanding of the county court and the President of the University. In order to aid as large a number as possible, it is ordered by the court that not more than the sum of \$60 per annum shall be appropriated to any one pupil; and in some cases it is found that only part of the tuition and contingent fees is needed, so that the aid which has been extended to over forty during the past year has ranged from \$10 to \$60—those receiving the largest sums being exceptional.

5. If the applicants are "youths" of Boone county, unable to educate themselves, and of good moral and intellectual qualities, whilst a preference is allowed to those having the ministry in view (Item 10), yet there appears to be nothing which excludes such as may have in contemplation any of the professional courses of the University. As the donor, for example, had struggled to obtain his professional education, it would be unnatural to suppose that, by any implication, the "indigent" and worthy professional student would be excluded.

The provision that one-fourth of the interest must annually be added to the principal of this fund may ultimately become a question of great magnitude, which will require judicial determination.

Applications for aid from the Rollins fund must hereafter be in writing; a blank form will be furnished by the Proctor, and when it has been filled it must be placed on file with the President. The applicant must appear in person at the opening of the first semester, September 13, as no reservation will be made.

Dr. Anthony W. Rollins, the founder of this aid fund, was the father of the Hon. James S. Rollins, who was for seventeen years President of the Board of Curators, and as a young man (1839), actively participated in the efforts which secured the location of the University to Boone county.

LITERARY SOCIETIES.

There are three literary societies of young men and two of young women connected with the University, viz.: The "Athenæan," the "Union Literary," the "Bliss Lyceum," the "Philalæthean" and the "Thalian." These societies hold weekly meetings for improvement in debate, declamation, oratory and composition, are in a flourishing condition, and form a most important means of culture, especially in speaking and writing.

An address is delivered before them, during Commencement week, and society diplomas are given to such members as belong to the graduating class.

YOUNG MEN'S CHRISTIAN ASSOCIATION.

The object of this organization, which dates its existence in the University of Missouri from January 18, 1890, is quite the same as in other such institutions of learning, namely, to represent and in every proper way to promote practical Christianity, particularly among the students. Its membership has risen from 65 to 160, its work has been rich in good results, and it has all along enlisted the sympathy and co-operation of the Faculty and the authorities of the University.

Devotional exercises are held Sunday afternoon in the hall of the Association, with an average attendance of nearly 100. Classes hold weekly meetings for the study of the Bible, and special religious services are held from time to time.

A movement of great importance has been set on foot: to erect a building to cost at least \$50,000, for the Young Men's and Women's Christian Associations. For this purpose the former has already pledged the sum of \$6,000, and any encouragement from sympathetic friends will be gratefully acknowledged. It is intended that the building shall be complete in its appointments, containing commodious rooms for reading, lectures, Bible classes, University class organizations, meetings of the Alumni and of the Christian associations, as well as bath-rooms and a gymnasium—in short, an edifice in which the whole State may feel pride and interest.

At the beginning of each scholastic year, a committee from the Y. M. C. A., to be recognized by their badges, will meet students at the trains and freely render them often valuable assistance in securing them boarding by introducing them to friends and to officers of the University, and by various other acts of kindness. A letter sent in advance to the President of the Young Men's Christian Association will receive prompt and cheerful attention.

YOUNG WOMEN'S CHRISTIAN ASSOCIATION.

This association is similar in its aims and methods to the foregoing. It was organized April 2, 1891, and its membership has grown from 32 to 50. Its object is the prosecution of Christian work and the development of Christian character, particularly among the young women of the University. Its weekly meetings are held at 4 p. m. every Sunday, one of them every month being a union meeting in conjunction with the Y. M. C. A.

Equally with the Young Men's Christian Association, the Young Women's shares the hearty and unanimous sanction and encouragement of the Faculty and authorities of the University.

PRIZES.

Stephens Medal—Founded by the Hon. James L. Stephens, a retired merchant of Columbia, and annually awarded for the best oration by a member of the Senior class.

The prize consists of a book in defense of the Christian religion, and a gold medal, for the purchase of which the annual interest on \$500 is available.

Junior Medal—This prize, offered by the literary societies for the best oration, is open to all students of the University below the Senior year.

Declamation Medal—This prize is offered by the literary societies to the best declaimer.

Astronomical Medal—For conditions of award, see Mathematical department.

Dachsel Prize.—\$10 in money, by Charles Dachsel, engineer, Jefferson City, Mo., is awarded for best thesis on steam engine.

McAnally Medal—For best English essay. (See English department, p. 38.)

Latin Prize—See Latin department.

Rollins Scholarships—See page 110.

UNIVERSITY EXTENSION.

Upon the invitation of the Kansas City Society for University Extension, the following courses were offered during the current year:

Constitutional Law, Judge Martin; Semitic Languages, Prof. Blackwell; Roman Religion, Prof. Jones; English Language, Prof. Allen; History of Mathematics, Prof. Smith; Biology, Prof. Purinton; Greek Life, Prof. Manly; Astronomy, Prof. Updegraff; History of Education, Prof. Blanton; Roman Law, Prof. Burnam; Archæology, Prof. Miller; Electrical Engineering, Prof. Shrader. The courses in Constitutional Law, Semitic Languages and English were called for, but could not be given on account of the burning of the main building of the University, which contained the University library and the private libraries of many of the professors.

ALUMNI.

The Alumni Association is composed of graduates of the University. It holds an annual meeting on Wednesday and Thursday of Commencement week, and is addressed in the University chapel by an orator previously selected from its own body.

The objects of this society are the promotion of education, especially in the halls of the Alma Mater, the reunion of early friends and co-laborers in literary pursuits, and the revival of those pleasing associations which entwine themselves about academic life.

The fee for membership is \$2. This is added to the permanent fund, only the interest of which is used. It is hoped that all graduates of the University, whether academic or professional, will become members of the Association. The University Librarian solicits aid in securing facts for the next triennial, and will be thankful for published notices of officers and graduates, and for books, pamphlets and articles, published by them.

The officers of the Association are: President, Hon. Gardiner Lathrop, Kansas City; First Vice-President, Hon. D. W. B. Kurtz, Columbia; Second Vice-President, Dr. H. W. Loeb, St. Louis; Secretary, C. B. Sebastian, Columbia; Treasurer, N. T. Gentry, Columbia; Orator '93, Mrs. Sallie Gentry Elston, Kansas City; alternate, F. N. Peters, Carrollton, Mo.

A subscription fund of \$3,000 has been raised and placed at interest, which is used in defraying the expenses of the annual meeting at Commencement—a very enjoyable and also a very profitable occasion. The Alumni constitute in fact one of the largest elements in the life of the University, and, efficiently organized, may become the most powerful agent in her development and prosperity. No effort should be omitted, both to strengthen the central organization at Columbia and to extend its branches throughout the State.

*Officers of the Local Chapters of the Alumni Association.**Chillicothe:*

T. F. Spencer, President.
 Scott L. Miller, Secretary.

Denver, Colorado:

T. M. Field, President.
 J. T. Bottom, Secretary.

Fort Smith, Arkansas:

F. A. Youmans, President.
 M. D. Hunton, Secretary.

Huntsville:

Dr. John T. Fort, President.
 Wm. Palmer, Secretary.

Jefferson City:

Henry W. Ewing, President.
 Frank M. Brown, Secretary.

Kansas City:

J. V. C. Karnes, President.
 Shannon C. Douglass, Secretary.

Macon City:

R. W. Barrow, President.
 John F. Williams, Secretary.

Moberly:

Judge B. S. Head, President.
 F. G. Ferris, Secretary.

Richmond:

Thomas N. Lavelock, President.
 F. P. Divelbiss, Secretary.

Salisbury:

Miss Leila Britt, President.
 L. W. Martin, Secretary.

Santa Fe, New Mexico:

W. E. Coons, President.
 N. B. Laughlin, Secretary.

Sedalia:

Charles E. Yeater, President.
 Louis Hoffman, Secretary.

Silver City, New Mexico:

G. W. Miles, President.
 R. H. Theilmann, Secretary.

Springfield:

Hon. J. C. Cravens, President.
 J. P. Bates, Secretary.

Slater:

Ulie Denny, President.
 Gay Hancock, Secretary.

St. Joseph:

Judge H. S. Kelley, President.
 W. H. Utz, Secretary.

St. Louis:

Judge Warwick Hough, President.
 R. H. Phillips, Secretary.

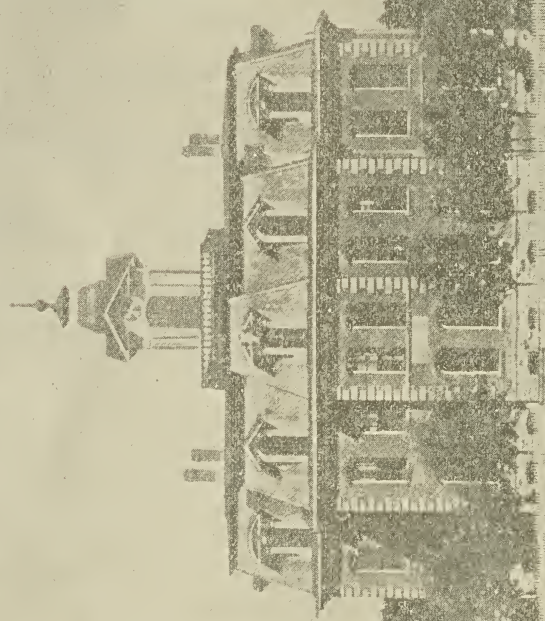


Photo by Geo. W. H. H.

SCHOOL OF MINES AND METALLURGY—Located at Rolla, Mo.

XXII. School of Mines and Metallurgy.

Executive Committee.

GEN. E. Y. MITCHELL	Rolla
JOHN S. LIVESAY.....	Rolla

Officers of the Committee.

EWING Y. MITCHELL.....	Chairman
DAVID W. MALCOLM.....	Treasurer
THOMAS M. JONES	Secretary

FACULTY.

- RICHARD H. JESSE, LL. D.,
President of the University.
- ELMO G. HARRIS, C. E. (University of Virginia),
Director and Professor of Engineering.
- WALTER BUCK RICHARDS, M. A. (University of Virginia),
Professor of Mathematics.
- AUSTIN LEE McRAE, S. D. (Harvard University),
Professor of Physics.
- CUTHBERT POWELL CONRAD, M. A. (University of Virginia),
Professor of Chemistry and Metallurgy.
- THOMAS LEWIS RUBEY, A. M. (University of Missouri),
Secretary and Instructor in Academic Department.
- PAUL J. WILKINS, B. S. (Michigan A. and M. College),
Proctor, and Instructor in Preparatory Department.
- FAYETTE A. JONES (Missouri School of Mines, '92),
Assistant in Engineering and Mathematics.
- DANIEL C. JACKLING (Missouri School of Mines, '92),
Assistant in Chemistry and Metallurgy.

INTRODUCTORY STATEMENT.

The School of Mines and Metallurgy, an Institute of Technology, was founded in 1870, under the act of Congress, approved July 2, 1862, entitled "An act donating lands to the several states and territories which may provide colleges for the benefit of agriculture and the mechanic arts," as a department of the Agricultural and Mechanical College of the University of the State of Missouri.

It is located at Rolla, a city of 2,000 inhabitants, on the St. Louis & San Francisco railroad, about midway between St. Louis and Springfield, 1,100 feet above sea-level, in a pre-eminently salubrious region.

The course of instruction deals in detail with the principles and the practice of Engineering, with special reference to Mining Engineering, Civil Engineering, Mechanical Engineering, Chemistry and Metallurgy, Mathematics, Physics and Electricity, and includes recitations, lectures, laboratory work and field practice. While a theoretical knowledge of each subject is required, great importance is attached to laboratory work and field practice as a source of mental training as well as a preparation for active pursuits. In the first of these, while a certain standard of excellence must be attained by all, the class system is not adopted, but each student, working independently of others, advances as rapidly as possible.

At the close of the year each member of the Senior class presents to the Faculty some independent investigation in a subject included in his course. These theses, together with all drawings to illustrate them, are preserved in the library of the school.

Provisions are now made for the following technical courses:

- I. Mining Engineering.
- II. Civil Engineering.
- III. Mechanical Engineering.
- IV. Chemistry and Metallurgy.
- V. Mathematics and Physics.

Each leading to the degree of Bachelor of Science.

The requisites for admission to any of these courses are passing grades in the subjects taught in the Preparatory course (see page 128). All the Engineering courses are the same through the Junior year; beyond it they diverge as outlined below.

Besides these regular courses, there are the following special ones:

- I. Assaying.
- II. Surveying.
- III. Electricity.

On the satisfactory completion of any one of these a certificate of proficiency will be given. The requisite for admission to one of these courses is an adequate knowledge of the preparatory subjects.

SCHEME OF STUDIES.

[The numbers in parenthesis refer to the exercises per week.]

ENGINEERING COURSES.

JUNIOR YEAR.

First Term.—General Chemistry (3), Elementary Mechanics (2), Descriptive Geometry (3), Trigonometry (5), Chemical Laboratory (2), Field-Work (2), Drawing (1).
Second Term.—General Chemistry (3), Elementary Mechanics (2), Stereotomy (3), Analytic Geometry (5), Chemical Laboratory (2), Field-Work (2), Drawing (1).

MINING ENGINEERING.

INTERMEDIATE YEAR.

First Term.—Analytic Geometry and Calculus (3), Physics (3), Chemical Technology (3), Mineralogy (2), Civil Engineering (3), Field-Work (2), Physical Laboratory (2).
Second Term.—Assaying (2), Physics (3), Chemical Technology (3), Geology (2), Mining Engineering (2), Chemical Laboratory (3), Physical Laboratory (2).

SENIOR YEAR.

First Term.—Analytic Mechanics (3), Metallurgy (2), Dynamo-Electric Machinery (2), Mining Engineering (5), Physical Laboratory (2), Chemical Laboratory (3).
Second Term.—Metallurgy (2), Electric Transmission of Energy (2), Mining Engineering (5), Physical Laboratory (2), Chemical Laboratory (3). Thesis.

CIVIL ENGINEERING.

INTERMEDIATE YEAR.

First Term.—Same as in Mining Engineering.
Second Term.—Calculus (3), Physics (3), Chemical Technology (3), Geology (2), Civil Engineering (3), Field-work (2), Physical Laboratory (2).

SENIOR YEAR.

First Term.—Analytic Mechanics (3), Dynamo-Electric Machinery (2), Civil Engineering (5), Field-work (2), Physical Laboratory (2), Drawing (2), Practical Photography (1).
Second Term.—Astronomy (1), Electric Transmission of Energy (2), Civil Engineering (5), Field-work (2), Physical Laboratory (2), Drawing (2). Thesis.

MECHANICAL ENGINEERING.

INTERMEDIATE YEAR.

First Term.—Same as Mining Engineering, except *Shop Practice* instead of *Field-work*.
Second Term.—Same as Civil Engineering, except *Shop Practice* for *Field-work* and *Mechanical for Civil Engineering*.

SENIOR YEAR.

First Term.—Analytic Mechanics (3), Dynamo-Electric Machinery (2), Mechanical Engineering (5), Shop Practice (2), Physical Laboratory (2), Machine Design and Drawing (3).
Second Term.—Electric Transmission of Energy (2), Mechanical Engineering (5), Physical Laboratory (2), Shop Practice (2), Machine Design and Drawing (3).

CHEMISTRY.

JUNIOR YEAR.

First Term.—General Chemistry (3), Elementary Mechanics (2), German (5), Trigonometry (5), Chemical Laboratory (3).

Second Term.—General Chemistry (3), Elementary Mechanics (2), German (5), Analytic Geometry (5), Chemical Laboratory (3).

INTERMEDIATE YEAR.

First Term.—German (5), Chemical Technology (3), Mineralogy (2), Chemical Laboratory (16).

Second Term.—Same as first term, except *Geology* in lieu of *Mineralogy*.

SENIOR YEAR.

Both Terms.—Metallurgy (2), Chemical Laboratory (30).

MATHEMATICS AND PHYSICS.

JUNIOR YEAR.

First Term.—Elementary Mechanics (2), Descriptive Geometry (3), Trigonometry (5), German (5), Drawing (3).

Second Term.—Same as first term, with *Stereotomy* for *Descriptive Geometry*.

INTERMEDIATE YEAR.

First Term.—Analytic Geometry and Calculus (3), Physics (3), German (5), English (5), Physical Laboratory (2).

Second Term.—Same as first term, with *Analytic Geometry* dropped.

SENIOR YEAR.

First Term.—Analytic Mechanics (3), Dynamo-Electric Machinery (2), Physical Laboratory (2). Senior Mathematics (5), English (5).

Second Term.—Mathematics (5). Electric Transmission of Energy (2), Physical Laboratory (2), English (5). Thesis.

Department of Engineering.

Prof. HARRIS.

In this department constant effort is made to give the student a working knowledge of his subject. He is taught to obtain practical results in the most direct and economical way, and is daily exercised in such problems as will come up in every-day practice. In field practice the Juniors enter the corps as rodmen, the Intermediates as instrumentmen, while the Seniors are placed in charge, under direction of the instructor.

The department is equipped with field instruments of the best make, sufficient for two full corps at once. Other instruments and apparatus will be added to meet all requirements.

One of the chief objects in view at present is to develop the facilities for instruction in mechanical engineering. We are not yet prepared to offer a complete course in shop practice, but thorough theoretical instruction is given, and a good beginning has been made for furnishing the practical training.

MINING ENGINEERING.

JUNIOR.

First Term.—Descriptive Geometry: Parallel and central projections as applied in draughting, with constant exercises in determining orthogonal and oblique projections of familiar objects.

Field-work.

Second Term.—Stereotomy: Descriptive geometry as applied to the art of stone-cutting.

Field-work.

INTERMEDIATE.

First Term.—Field Instruments: The field instruments of the engineer dissected and studied in detail as to theory, construction, adjustment, uses and capabilities.

Engineering Geodesy: General and particular methods of traversing, triangulating, direct and indirect leveling; land, city, topographical and hydrographical surveying; United States system of subdivision of land.

Field-work. Drawing.

Second Term.—Mine Surveys.

Exploitation of Mines: Theory of deposits in beds, lodes and pockets; prospecting, exploration and development by shafts, inclines and tunnels; underground transportation, drainage, ventilation, lighting.

Tunneling, Masonry, Quarrying: Strengths of stone and brick, cements and mortars; foundation, stability of masonry structures.

Drawing.

SENIOR.

First Term.—Hydraulics: Collection and measurement of water, conveyance through pipes and canals; designs of dams and pipe lines.

Prime Movers: Hydraulic motors, steam engines and boilers, horse-power appliances.

Graphical Statics.

Second Term.—Transmission of power: Cable, compressed air, electricity.

Mining Machinery: Pumps, ventilators, hoists, drills.

Mechanical Concentration of Ores.

Drawing. Thesis.

CIVIL ENGINEERING.

Junior year and first term of the Intermediate same as under Mining Engineering.

INTERMEDIATE.

Second Term.—Railroad Engineering: Surveys, construction and maintenance.

Highway Engineering: Surveys, construction and maintenance; street paving.

Field-work. Drawing.

SENIOR.

First Term.—Same as under Mining Engineering.

Second Term.—Bridge Engineering: Determination of loads, strains and dimensions for bridges, roofs and other framed structures.

Hydraulic Engineering: Water supply of cities and towns, sewerage; irrigation.

Field-work. Drawing. Thesis.

MECHANICAL ENGINEERING.

JUNIOR.

Identical with Junior Mining Engineering. with shop practice substituted for field-work.

INTERMEDIATE.

First Term.—Same as first term in Intermediate Mining Engineering.

Second Term.—Kinematics. Drawing. Shop Practice.

SENIOR.

First Term.—Same as first term in Senior Mining Engineering.

Second Term.—Transmission of power: Cable, compressed air, electricity.

Mechanics of Machines.

Drawing. Thesis.

DRAWING.

FIRST YEAR.

The first year's work for all regular students in the Engineering department is almost entirely at the drawing-board. Here belongs naturally all work in Descriptive Geometry and in Stereotomy. The use of drawing instruments—simple problems in points, lines and planes—graphical solution of the more complicated problems—shading of projections, in pencil, by free-hand pen-work, with the ruling-pen, in water-colors and India-ink.

SECOND YEAR.

Work assigned according to the profession chosen by the student. The students in Civil and in Mining Engineering will select some complete engineering structure and present it in simple plan and elevation—one in axonometric, another in perspective—all neatly shaded, tinted and lettered. All field surveys must be plotted neatly, and one topographical drawing made from notes taken in the field by the student will be required of each. The student in Mechanical Engineering will be continuously exercised in mechanical and machine drawing.

THIRD YEAR.

Seniors have a variety of exercises in Graphical Statics, and are required to present working drawings of many structures, such as bridges, arches, dams, etc. The thesis must be accompanied by drawings fully illustrating it.

Department of Chemistry and Metallurgy.

Prof. CUTHBERT P. CONRAD.

The courses in this school have been especially arranged to supply the needs of those who wish to prepare themselves for positions as Assayers, Chemists and Mining Engineers. Students who are desirous and capable of accomplishing special lines of work may arrange for such courses in Analytic Chemistry and Assaying as are adapted to their special requirements.

Instruction in the following courses is given each session:

1. *General Chemistry*.—Chemical Physics, Chemical Philosophy, Inorganic and Organic Chemistry, regular weekly exercises in Stoichiometric and other chemical problems. Junior—three times a week both terms.

Text-Books: Lecture Notes, Fowne's Chemistry.

2. *Chemical Technology*.—Smelting and treatment of ores of metals—manufacture of acids, salts, glass, paper, mortar, cements and other building materials, sugar, wine, spirits, oils, paints, soaps, bleaching materials, fuels, etc., etc. A general cabinet, illustrative of all branches of Chemical Technology, is being gradually collected. Intermediate—three times a week, both terms.

Text-book: Wagner's Chemical Technology, 13th edition.

3. *Metallurgy*.—In addition to the brief course required of the Intermediate class, the members of the Senior class meet weekly for the discussion of assigned topics in the metallurgy of gold, silver, copper, zinc, lead and iron. Attention is directed to fuels, fluxes, air supply, furnaces, refractory materials, study of slags, preparation and concentration of ores, improved forms of stamps, mills and pans. The modern methods of Hydro-metallurgy and Electro-metallurgy are treated with merited fullness. Special topics are assigned to each student, upon which he is required to prepare a paper embodying the results of his reading in authoritative works on Metallurgy, Current Literature, Journals, Transactions, etc., with which the library is well supplied. These papers are taken up in class and critically discussed by the other students. It is expected to make visitation to the Mining and Metallurgic works of the State a part of this course.

4. *Blowpipe Analysis and Determinative Mineralogy*.—This class meets regularly three times each week throughout the first term of the Junior year. Previous to beginning regular analysis with the blowpipe, each student is required to complete a short course in blowpipe practice; after which, metals, oxides, salts and alloys are given, upon the composition of which, as determined by blowpipe tests alone, he is required to report. This work is followed by a thorough course in Determinative Mineralogy, during which the student examines, identifies and classifies 100 native minerals.

Text-books: Printed Notes and Schemes, Foye's Hand-book of Determinative Mineralogy.

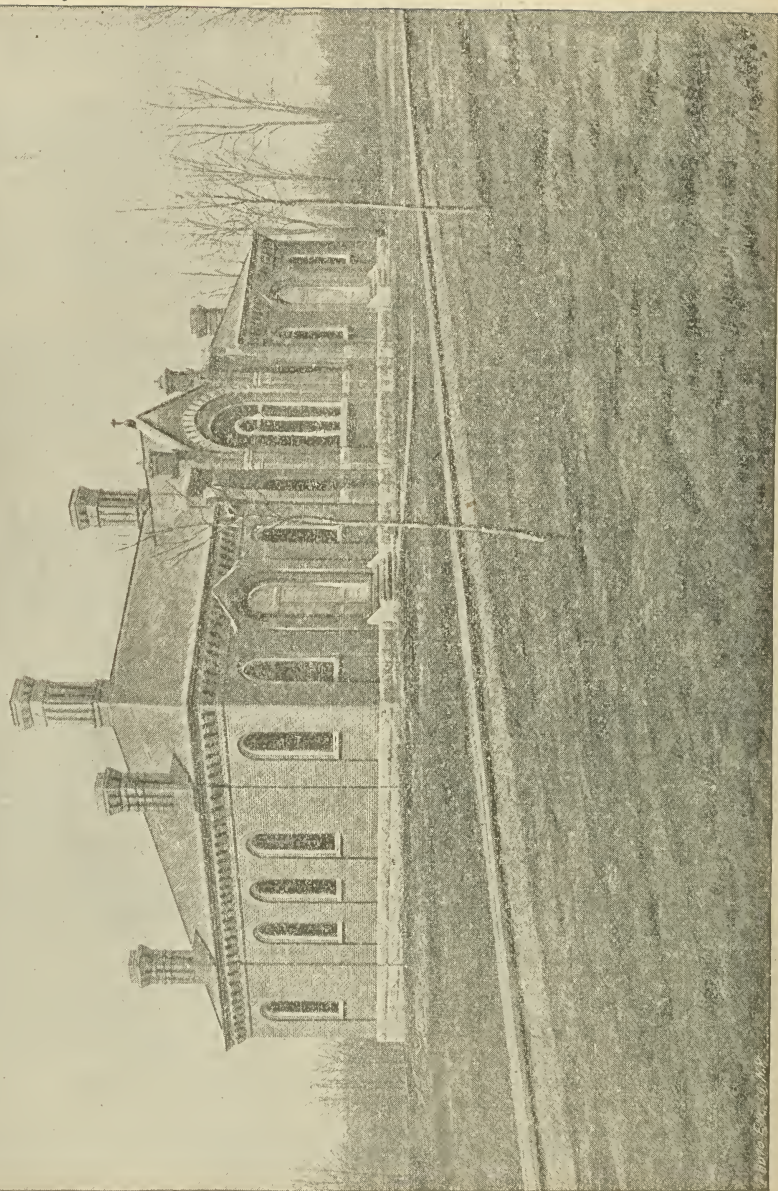
5. *Analytic Chemistry*.—This course is begun with a series of selected exercises in Manipulation and Laboratory Practice. A systematic and thorough course of Qualitative Analysis follows. After the student attains sufficient skill to enable him to determine the composition of substances given him, and to make complete and accurate separations, he is allowed to begin Quantitative Analysis.

Text-books: Clowe's Handbook, Thorpe, Bolton, Classen, Fresenius, Crookes.

6. *Assaying*.—Intermediate—second term.

Special attention in this course is given to the rapid estimation and valuation of ores and furnace products, both by the fire and the wet assay.

Fire Assays: Gold and silver ores, also mill checks, are made the subjects of special study and assays, both by the crucible and scorification methods, are required. Lead and copper ores are assayed by fire methods applicable to the ores in question.



CHEMICAL LABORATORY.

Wet Assays: Volumetric methods are carefully studied and applied to the rapid determination of copper, zinc, iron, etc., etc.

Text-books: Rickett's Assaying, Sutton's Volumetric Analysis.

Special students may pursue, by permission, the study and analysis of any class of ores or metallurgic products. Young men who have neither the time nor means to spare to take the full course may accomplish much in the way of chemical analysis and assaying by devoting their entire time to it during a single year.

All Laboratory students furnish their own blowpipes, platinum, crucibles and apparatus, silver and gold solutions, and pay for gas and fuel consumed and for apparatus damaged or broken.

A deposit of \$5 per term, covering the value of the apparatus and chemicals issued, is required to be placed in the hands of the Treasurer by each Laboratory student. This deposit, less the value of material consumed, is returned at the close of the year.

THE CHEMICAL LABORATORY.

The Chemical Laboratory has been in use five years, and has been found satisfactory. It was planned and built solely with reference to the work in the school, and the entire building is used by the Chemical department.

It consists of the quantitative laboratory, the qualitative laboratory, professor's laboratory, lecture room, assay laboratory and weighing room, a quantitative and qualitative evaporating room, preparation room, a supply room and two basement rooms, and furnishes accommodations for seventy-five students.

No pains have been spared to make the assay laboratory complete in every respect. It is located on the first floor, and not in the basement. The reduction furnace, as well as the muffle furnaces, are of the newest and best. Two large muffle furnaces, two smaller ones, one gas furnace, an ore crusher, pulverizing plate, ore and assay balances, with other facilities, are provided for the use of students.

Facilities for securing heat, light and ventilation are excellent; ample provision is also made for carrying off foul and dangerous gases; gas and water are supplied to each table. All parts of the building are thoroughly and judiciously equipped, and nothing has been left undone to make this laboratory one of the most complete in the country.

It is open to students daily from 8 a. m. to 5 p. m.

Department of Mineralogy and Geology.

Temporarily Assigned to Prof. CONRAD.

The instruction on these subjects begins with Determinative Mineralogy in the Junior year, and is continued with Systematic Mineralogy, Petrology and Geology in the Intermediate year.

Models, diagrams, natural crystals and goniometers are used in imparting a knowledge of the principles of Crystallography.

The course in Mineralogy is fully illustrated by a complete and well-arranged cabinet of minerals.

In addition to the usual course of Dynamical, Structural and Historical Geology, special attention is given to Chemical and Economic Geology. The course of instruction embraces the origin of vein stones and ore deposits, mineral waters, coal, petroleum and natural gas.

The study of geology is made interesting and practical by complete stratigraphical and paleontological collections, and by field-work and excursions.

Department of Mathematics.

Prof. RICHARDS.

JUNIOR.

First Term --Trigonometry, Plane and Spherical, Fundamental Definitions and Formulae—Construction and use of Logarithmic tables—Solution of triangles—Computation of actual heights and distances.

Second Term.—Conic Sections and a few Higher Plane Curves.

Text-books: Wells' Plane and Spherical Trigonometry, Wentworth's Analytic Geometry. For reference—Todhunter's Plane and Spherical Trigonometry, Puckle's Conic Sections, Salmon's Conic Sections, Searle's or Henck's Field-book. Daily, both terms, required in all the courses.

INTERMEDIATE.

First Term.—Analytic Geometry of Three Dimensions, chiefly the Conicoids.

Second Term.—Infinitesimal Calculus.

Text-books: Venable's Notes on Solid Geometry, Taylor's Elements of the Calculus (with Notes and Lectures). For reference—Salmon's, Todhunter's and Williamson's mathematical works. Thrice weekly, required in Courses I, II, III, V.

For students of Mining Engineering, to compensate for larger requirements in Chemistry and Metallurgy, a briefer treatment of the above subjects, extending through one term, will be given.

SENIOR.

Designed only for students in the special course in Mathematics and Physics (V), and such others as may wish to extend their mathematical studies beyond the usual undergraduate range; subject to variation from year to year, at the Professor's discretion, to meet the needs and accord with the purposes of the applicants.

First Term.—Analytic Geometry and Calculus, select chapters of Salmon's Conic Sections and Williamson's Differential and Integral Calculus.

Second Term.—Select portions of some two of the following subjects: Projective Geometry (Cremona), Theory of Equations (Todhunter), Determinants (Muir's), Differential Equations (Forsyth), Quaternions (Kelland & Tait, and Tait).

Lectures on the history of Mathematics are given during the year.

The library contains the chief works on mathematics, in English, French and German, and affords the student an opportunity of extending his research at will.

The beginning of a Mathematical Seminar has been made this year. Nine men responded voluntarily to the invitation to join a club for independent mathematical study. These, with occasional visitors, meet on alternate Thursdays and listen to a lecture by the Professor or to papers by some of their own number, the meeting closing with a general discussion of the topic under consideration. Some of the subjects studied this year have been: The Early History of Mathematics; Theory of Numbers; the so-called Imaginaries, their Geometric Interpretation and Analytic Use; the Solution of Higher Equations.

Department of Physics.

Prof. McRAE.

This department was organized in September, 1891, and includes the subject of Analytic Mechanics. Two rooms on the third floor and two in the basement of the main building have been fitted up as a Physical Laboratory. A workshop is supplied with the necessary tools, and the student is encouraged in designing and making, with his own hands, any special apparatus he may require. A steam engine and boiler, with the necessary shafting and pulleys, have been placed in the basement. A United States dynamo serves the double purpose of lighting the building and of furnishing a current for electrical measurements. An eleven-inch swing Reed lathe, with both foot and power attachments, allows wood and metal turning, screw cutting, etc., to be performed with facility.

APPARATUS.—Atwood's machine, large air pump with accessories, standard and chemical thermometers, standard mercurial and aneroid barometers, hydrometers, sonometer and standard tuning fork, Toepler-Holtz electrical machines, Leyden jars, large Ruhmkorff coil, Geissler's and Crook's tubes, Wheatstone bridges, resistance boxes, galvanometers, batteries, Weston volt-meter, telephone and telegraph instruments, Weston ammeter, Beck microscope, oxyhydrogen cylinders, three optical lanterns, lenses, glass and bi-sulphide of carbon prisms, a large porte lumiere, and a fine collection of mechanical, physical and astronomical lantern slides. New instruments are added to the laboratory as fast as the funds of the school permit.

JUNIOR.

Both Terms.—Elementary Mechanics: Twice weekly.

INTERMEDIATE.

Physics: This class meets three times a week and spends two afternoons a week in the Physical laboratory.

First Term.—Meteorology, with special reference to rainfall and water supply; Heat, general principles, thermometry and calorimetry; Optics, optical instruments and photometry; Measurements in laboratory.

Second Term.—Electricity and Magnetism; Telegraph and Telephone Circuits; Electrical testing in laboratory.

SENIOR.

First Term.—Practical Photography: Required of students in Civil Engineering, elective for others. Once weekly.

Analytic Mechanics: Thrice weekly.

Second Term.—Practical Astronomy: One lecture a week on determining time, latitude and longitude.

Electric Transmission of Energy: Two lectures a week. Electric lighting, electric railways, electric pumping, hoisting and ventilating apparatus will be studied.

Two afternoons a week throughout the year are spent in the laboratory.

Students in Metallurgy will also receive instruction in the electrical methods used in the extraction, purification and deposition of metals.

Post-graduates or special students in Physics, after completing the prescribed course, may take up Mascart and Joubert's Electricity and Magnetism, Fourier's Theory of Heat, Minchin's Kinematics and Williamson's Dynamics or Practical Electrical Engineering.

ACADEMIC COURSE.

The following course of study was established in pursuance of an act of the Legislature of Missouri in 1885. Students must have completed the studies of the first year of the preparatory course before they can enter the regular academic course. A diploma of graduation will be granted to students who complete this course.

FIRST YEAR.

<i>First Term.</i>	<i>Second Term.</i>
General History.	General History.
German.	German.
Geometry (plane).	Geometry (solid).
Civil Government.	Botany.

SECOND YEAR.

Elementary Physics.	Elementary Chemistry.
English and American Literature.	English and American Literature.
German.	German.
Higher Algebra.	Higher Algebra.

THIRD YEAR.

English History.	Political Economy.
Zoology.	Logic.
Psychology.	Descriptive Astronomy.
Rhetoricals.	Physical Geography.
Book-keeping (optional).	

PREPARATORY COURSE.

This course is maintained for such as find special preparation for the advanced courses necessary. Students on completing it are admitted to any of the advanced courses without examination.

FIRST YEAR.

<i>First Term.</i>	<i>Second Term.</i>
Higher Arithmetic.	Higher Arithmetic.
English Grammar.	Composition and Rhetoric.
Elementary Algebra.	Algebra.
United States History.	Physiology and Hygiene.

SECOND YEAR.

English.	English.
Higher Algebra.	Higher Algebra.
Elementary Physics.	Solid Geometry.
Plane Geometry.	Elementary Chemistry.

GENERAL INFORMATION.

BUILDINGS AND EQUIPMENTS.

The buildings of the School of Mines are situated in the most elevated part of the city of Rolla. They are substantial brick structures, well ventilated and lighted, and heated by the best furnaces manufactured. The main building has recently been painted and kalsomined throughout, and the laboratory, one of the most complete in the country, has been in use but five years.

The different departments of the School are well supplied with apparatus. Several hundred dollars have been expended this year in the purchase of instruments and apparatus for the departments of Engineering, Chemistry and Physics, and further purchases will be made as additional needs are felt and financial condition of the School will allow.

The students' club-house, or dormitory, built in 1890, contains commodious and comfortable rooms for thirty young men. Two students occupy one room. The dining hall and culinary department can accommodate sixty. This year the students pay \$12 a month for board in the club-house. Whenever they shall deem it desirable the students will be allowed to form themselves into a club and employ their own caterer. In this manner it is believed that they will be able to board themselves at comparatively low cost.

Students wishing to engage rooms in the club building for next year should do so before September 1, as the supply of rooms may be exhausted. To engage a room a deposit of \$5 is required as an earnest of good faith on the part of the student. This money will be refunded at the opening of school whether the student take the room or not.

EXPENSES.

A matriculation fee of \$10, payable on entrance, and a library fee of \$2 a term, payable on the first day of each term, are required of every student.

All laboratory students furnish their own blowpipes, platinum, silver and gold solutions, crucibles and apparatus, and pay for gas and fuel consumed and for apparatus damaged or destroyed. A deposit of \$5 per term, covering the value of the apparatus and chemicals issued, is required to be placed in the hands of the Treasurer by each laboratory student. This deposit, less the value of material consumed, is returned at the close of the year.

Board, including fuel, lights, washing, etc., can be obtained for \$12 to \$15 a month.

The necessary expenses for the year are as follows:

	Moderate.	Ample.
Matriculation fee.....	\$10 00	\$10 00
Library fee	4 00	4 00
Books, stationery and chemicals	15 00	25 00
Board, fuel, lights, washing, etc.....	96 00	135 00
Total.	\$125 00	\$174 00

LIBRARY.

The library contains 2,700 volumes. Extensive works upon Engineering, Mathematics, Chemistry, Physics, Assaying and Metallurgy afford to all students in these departments an excellent opportunity to pursue an extended course of reading in connection with their class work. The library also contains the standard works in English and American poetry, fiction, biography and history, provided with especial view to the needs of Academic students. The following periodicals for the current year are found on the reading tables of the library:

American Chemical Journal.	Journal of Analytical and App. Chemistry.
American Journal of Science.	Judge.
American Journal of Mathematics.	Ladies' Home Journal.
Annals of Mathematics.	Leslie's Illustrated Weekly.
Century Magazine.	Life.
Chemical News.	Literary Digest.
Electrical World.	Lippincott.
Engineering Magazine.	Nature.
Engineering News.	Nation.
Engineering and Mining Journal.	North American Review.
Forum.	Philosophical Review.
Harper's Monthly.	Popular Science Monthly.
Harper's Weekly.	Popular Science News.
Public Opinion.	Scribner's Magazine.
Puck.	Scientific American.
Railroad and Engineering Journal.	Scientific American Supplement.
Science.	

The library is open daily from 8:30 a. m. to 4:30 p. m. Books may be taken out by the students under certain regulations.

ATHLETICS.

Through the liberality of the Curators an athletic field has been enclosed and graded for the benefit of the students. It furnishes ample space for base-ball, foot-ball and lawn tennis. An athletic association exists among the students, and it is hoped that means will soon be provided for the erection of a gymnasium.

LITERARY SOCIETIES.

Two literary societies were organized during the year—the Philo Literary society by the young men and the Alpha club by the young women of the school. The "Alpha" meets every Saturday afternoon and the "Philo" every Saturday evening for improvement in debate, oratory and composition.

TERM EXAMINATIONS.

During the last week of each term all students are required to stand written examinations on the studies pursued, and the results of these examinations, with the average monthly grades, determine their term grades. A student, to pass, must attain at least 75 per cent.

MONTHLY REPORTS.

Regular monthly reports are sent to the parents or guardian of each student, showing the student's grade in scholarship for the month, and giving such other information in regard to his progress, attendance, etc., as may be thought to be of interest. The attention of parents and guardians is particularly called to these reports.

DEGREES.

A certificate of distinction is conferred on one who has attained three-fourths of the value of the questions at an intermediate or final examination.

UNTITLED DEGREES.

1. A Certificate of Proficiency is conferred on one who has attained the required standard at all the examinations in any of the following special courses: Geology and Mineralogy, General Chemistry, Fire Assaying, Botany and Zoology, Physics, Geodesy, and the Preparatory course.

2. A Diploma of Graduation is conferred on one who has passed all examinations in any of the following departments: Mathematics, Physics, Analytical Chemistry, Engineering, and the Academic course.

SCIENTIFIC DEGREES WITH TITLES.

The degree of *Bachelor of Science in Mathematics and Physics* is conferred upon one who has passed examination on all the subjects of instruction in the course of Mathematics and Physics.

2. The degree of *Bachelor of Science in Chemistry* is conferred on one who has passed examination on all of the work of the special Chemical course.

PROFESSIONAL DEGREES WITH TITLES.

1. The degree of Bachelor of Science in Civil, Mining, Mechanical Engineering, respectively, is conferred on one who has passed examination on all of the subjects of instruction in the Civil, Mining, Mechanical Engineering Course, respectively.

2. The degree of Civil, Mining, or Mechanical Engineer is conferred on one who, having graduated in Civil, Mining or Mechanical Engineering and received the Bachelor's degree therein, has identified himself with the profession during a period of not less than three years, and during that time has demonstrated by work his fitness for his chosen profession.

COMMENCEMENT.

The annual Commencement exercises are held in the Assembly room, at the close of the work in June. The exercises consist of an address by some prominent speaker, the conferring of degrees and granting of diplomas by the Director, and an essay or oration by some member of the graduating class.

At the Commencement exercises on Thursday, June 11, 1891, the address was delivered by Rev. Waller E. Boggs, of Caledonia, Mo.

Certificates of proficiency were conferred on the following students for the satisfactory completion of the subjects indicated:

Mathematics—

Dean, Geo. R.

Analytical Chemistry—

Johnson, E. M.

Seamon, F. H.

Stewart, Arthur J.

Assaying—

Jones, F. A.

Jones, H. I.

Physics—

Dean, Geo. R.

Holman, Wm. P.

The following degrees were conferred:

Bachelors of Science—

George R. Dean, B. Sc.,

Mathematics and Physics.

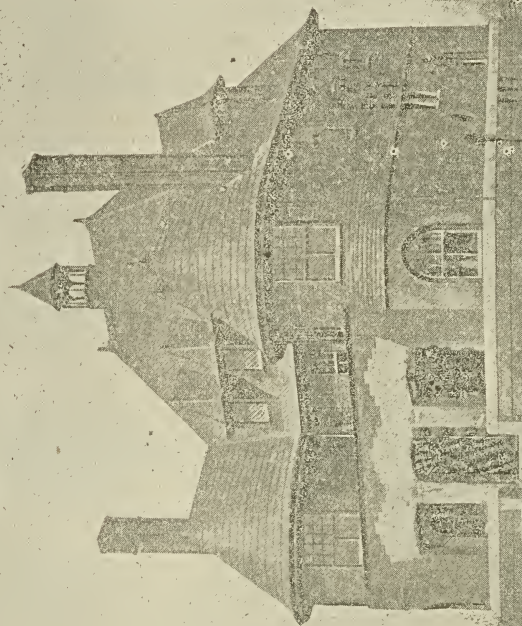
Arthur J. Stewart, B. Sc., Chemistry.

Sally Millard, B. Sc.,

General Course.

Mining Engineer—

Frank H. Seamon.



CLUB-HOUSE.

W. & A. L. 1860

LIST OF STUDENTS.

ACADEMIC STUDENTS.

Name.	Postoffice.	County.
<i>POST-GRADUATES.</i>		
Froley, John W.....	Shelbina.....	Shelby.....
Hancock, Etta.....	Keytesville.....	Chariton.....
<i>UNDER-GRADUATES.</i>		
<i>SENIOR CLASS.</i>		
Adams, Newton T.....	Shelbina.....	Shelby.....
Bronson, Harl Howard.....	Sedalia.....	Pettis.....
Brown, George Lincoln.....	Reynard.....	Bates.....
Caldwell, Robert.....	Weatherby.....	DeKalb.....
Conley, Milton Robards.....	Columbia.....	Boone.....
Denny, James Milton.....	Roanoke.....	Howard.....
*Fellows, John Nelson.....	Weston.....	Platte.....
Goodrich, James Edward.....	Cameron.....	Clinton.....
Hancock, Alice.....	Keytesville.....	Chariton.....
Hart, Harry Gill.....	High Point.....	Moniteau.....
Hatton, Moses Wesley.....	Farmington, Io.....	
Keyser, Cassius Jackson.....	McCurry.....	Gentry.....
Lamotte, John Harry.....	Roanoke.....	Howard.....
Lynch, Samuel Adams.....	Columbia.....	Boone.....
Mansfield, Mary.....	St. Louis.....	
*Moore, Harry Lancaster.....	Pueblo, Col.....	
Sams, Wm. Meade.....	Kansas City.....	Jackson.....
Selsor, Mark.....	Madelaine.....	Daviss.....
<i>JUNIOR CLASS.</i>		
Adams, Jennie.....	Shelbina.....	Shelby.....
Anthony, Francis Richard.....	Maryville.....	Nodaway.....
Asendorf, George Wm Henry.....	Craig.....	Holt.....
Beach, Emory V.....	Helena, Mont.....	
Bishop, John Edmond.....	California.....	Moniteau.....
Bryan, Richard Franklin.....	Carbon Centre.....	Vernon.....
*Buffington, Samuel Augustus.....	Salisbury.....	Chariton.....
Debord, King.....	Fillmore.....	Andrew.....
Donohue, Mary.....	Columbia.....	Boone.....
Eitzen, Cora Allis.....	Washington.....	Franklin.....
Gerig, Ida.....	Columbia.....	Boone.....
Gerling, Henry Joseph.....	".....	".....
*Haines, Charles Gregg.....	".....	".....
Hansen, Lydia.....	Jefferson City.....	Cole.....
Hartzell, Florence.....	Cape Girardeau.....	Cape Girardeau.....
Hodge, Robert Walter.....	Brunswick.....	Chariton.....
Hoffman, Gustave Adolph.....	Boeger's Store.....	Osage.....
Kiehl, Herman G.....	Beemont.....	Franklin.....
Myer, Jesse.....	Salisbury.....	Chariton.....
Pettingill, Minnie.....	Centralia.....	Boone.....
*Taylor, Thomas Jackson.....	St. Louis.....	
Tefft, Jonathan Edward.....	Springfield.....	Greene.....
Wade, John Franklin.....	Bolckow.....	Andrew.....
*Walker, Harry Bruce.....	Skidmore.....	Nodaway.....
Weltner, Benjamin Franklin.....	Wellsville.....	Montgomery.....
White, James Paul.....	Franklin.....	Howard.....

Name.	Postoffice.	County.
SOPHOMORE CLASS.		
*Allen, Edward Thorpe.....	Columbia	Boone
Atterbury, Eugene	Madison	Monroe
*Aydelott, Walter Cecil	Truxton	Lincoln
Barber, Lizzie	San Antonio, Tex	Boone
Barnett, Beulah	Columbia	Holt
Blair, Ivan Leo	Craig	Boone
Broadhead, Garland Carr	Columbia	Boone
Burnam, John Charles	Pueblo, Colo	Jackson
*Campbell, Wm. Thaddeus	Lee's Summit	Miller
Davidson, Everett Jerome	Aurora Springs	Boone
Eppes, Thomas Jefferson	Columbia	Boone
*Fyfer, John Kirkbride	Marshall	Saline
Gaines, Charles Latham	Hinton	Boone
Goslin, Benjamin Franklin	St. Louis	Clinton
Granger, Orrin Wilbur	Plattsburg	Boone
Guyer, Michael Fred	Columbia	Boone
Hack, Mary	Deer Park	Atchison
Haydon, Curtis	Fairfax	Henry
*Howell, Charles M.	Garland	Johnson
*Immer, George C	Warrensburg	Boone
*May, David Wm	Columbia	Howard
*Mitchell, Homer Rawlins	White's Store	Pike
Peeler, Wm. Baraie	Curryville	Boone
Riggs, Norman Colman	Columbia	Jackson
Riggs, Inez Lucretia	Kansas City	Jackson
Shaefer, Jean Augusta	St. Catharine	Linn
Smith, John Bertram	Nevada	Vernon
*Smith, J. Roy	Moberly	Randolph
Spalding, Elliott	Columbia	Boone
*Stone, Kimbrough	Marshall	Saline
Terrill, Vincent Calvin	Fillmore	Andrew
Terrill, Henry Roberts	Indian Grove	Chariton
Turner, Edwin		
Wetack, John Allen		
Williams, Henry Clay		
Zillman, Christian Charles		
FRESHMAN CLASS.		
Allee, Gail Darwin	Olean	Miller
Banks, Anna	Columbia	Boone
Barnett, Sentiny Rives	"	"
Barnett, Mary Jessie	"	"
*Bautzer, Edward Hugh	"	"
Beazley, George Hamilton	"	"
Berry, Thomas Dorsey	Brookston, Tex.	Boone
*Blanton, Martha	Columbia	Shelby
*Bodine, Cooper Parsons	Shelbina	Jackson
Botts, Wm. Ford	Kansas City	Buchanan
Boyer, John Sidney	Easton	Boone
Bradford, Alexander	Columbia	Franklin
*Briegleb, Charles Ferdinand	St. Clair	Bates
Coleman, George Wm	Rich Hill	Boone
†Conley, Wm Kirtley	Ashland	Moniteau
Conley, Wm. Thompson	Columbia	Boone
Cook, Sydney Francois	Clarksburg	Boone
Cooper, James Wm	S McAlester, I.T.	Johnson
Crumbaugh, Lucy Neil	Columbia	Saline
*Curtis, Oramel Moffat	Warrensburg	Clinton
*Dawes, Hamilton Miller	Marshall	Franklin
*DeBerry, Wm. Angus	Plattsburg	Shelby
Detweiler, Andrew Jackson	Washington	Audrain
*Dillenbeck, Chas. Leroy	Shelbina	Carroll
*Downing, Robert Edward	Saline	Bollinger
Doyle, John Harrison	Tina	Marion
*Drum, John Wm	Marble Hill	Bates
*Dudley, C. C	Withers' Mill	Boone
*Duval, Jacob Beauford	Virzinia	Scott
Edwards, G. D.	Columbia	Linn
*Ellis, E. P.	Commerce	Dent
*Evans, Edwin E	Meadville	Pettis
*Fischer, Oscar E	Salem	Chariton
*Fowler, Thomas Robert	Sedalia	Johnson
Fullbright, Jay	Rothville	Knox
*Goodnight, Thomas	Montserratt	
Griggs, Austin B.	Hedge City	

† Dead.

Name.	Postoffice.	County.
Guitar, Odon	Columbia	Boone
Haden, Homer	Frankford	Pike
*Hamilton, A. P.	Missouri City	Clay
Hancock, Mary	Keytesville	Chariton
Hawkins, A. B.	Paris	Monroe
Hayes, Thomas A.	Adair	Adair
*Hays, Wm Henry	Jackson	Cape Girardeau
*Hill, Frank W.	Keytesville	Chariton
Hill, George Washington	Rocheport	Boone
Howard, Edward	Jackson	Cape Girardeau
Jackson, Clarissa	Columbia	Boone
Jarvis, Earle		
Jewett, H. H.	Shelbina	Shelby
*Jones, Wm. Thomas	Humphreys	Sullivan
Kahn, Otille	Brookfield	Linn
Keyser, Ella Maude	Ridgeway, O.	
Kraemer, Eugene	California	Moniteau
Letchworth, Thomas J.	Versailles	Morgan
Letton, Chas. Hedrick	Walker Station	Vernon
Loeb, Clarence	Columbia	Boone
Mairs, Thomas Isaiah	Browning	Sullivan
Manring, John F.	McFall	Gentry
Marshall, Wm. N.	Unionville	Putnam
*McCluer, Robert Watson	O'Fallon	St. Charles
*McCulloch, Albert J.	Pisgah	Cooper
*McLain, Wm. David	Jackson	Cape Girardeau
Miller, George Edward	Weldon Springs	St. Charles
*Nelson, George Adney	St. Joseph	Buchanan
Newton, Ned Ernest	Bolivar	Polk
*Niedermeyer, Fred. W.	St. Louis	
Nordleet, Viola	High Point	Moniteau
Oldham, Wm Abner	Columbia	Boone
O'Toole, Chas. Furey	Moundville	Vernon
*Park, A.	Columbia	Boone
Payne, Mary C.	High Point	Moniteau
Rees, Minnie	Columbia	Boone
Sankey, P. H.	Salem	Dent
Schmidt, Louise	Hannibal	Marion
Sears, Phidelia	Barnett	Morgan
*Shipman, Robert Lee	Holden	Johnson
*Shrader, Eugene W.	Paris	Monroe
Smith, C.	Columbia	Boone
*Smith, Joseph Edward	Endicott	—, Wash
*Stampfli, George Joseph	Jefferson City	Cole
*Stanley, Robert Dean	Buffalo	Dallas
Stephens, Lenna	Columbia	Boone
Striker, Herbert	Marshall	Saline
Stringer, George Jefferson	Humphreys	Sullivan
Talbot, Edward Bast	Mexico	Audrain
Terrill, Lizzie E.	Moberly	Randolph
*Thompson, Thomas W.	Pendleton	Warren
*Thompson, Benjamin		
*Vallier, James	Columbia	Boone
Viles, Landon C.	Bolivar	Polk
Weatherford, Guy	Unionville	Putnam
*Wickham, Frank Dickinson	Gallatin	Daviess
*Wilkerson, George Rappeen	Sedalia	Pettis
*Woodside, Ray Clark	Salem	Dent
*Yowell, Benjamin Jasper	Columbia	Boone
Zarn, George Gerner	Platte City	Platte
Zimmerman, Lizzie P.	Sedalia	Pettis

—98

PREPARATORY CLASS.

Adams, Thomas Barrett	Norborne	Carroll
Adams, Arthur	Buckner	Jackson
Agnew, James W.	Columbia	Boone
Alexander, Wm. C.	St. Charles	St. Charles
Allen, Mary Swepson	Columbia	Boone
*Allen, Robert Fairfax	Kansas City	Jackson
Anderson, Chas. Frederick	Moscow Mills	Lincoln
Bain, Claude	Spickards	Grundy
*Barnes, Chas. M.	New Madrid	New Madrid
Barnett, James Sanford	Columbia	Boone
Barnett, George H.		
*Beazley, Lewis Craig	Seymour	Webster
Blackwell, Laura Cherry	Columbia	Boone
Blanton, David Anderson		

Name.	Postoffice.	County.
Boisseau, Oscar G.	Holden	Johnson
*Bostic, John Langford	Kahoka	Clark
Bragg, W. O.	Shelbina	Shelby
Broadhead, Marion	Columbia	Boone
*Brown, Phineas A.	Reynard	Bates
Burks, David Faulk	Columbia	Boone
Busby, Wm. G.	Wakenda	Carroll
*Callahan, W. M.		
*Calley, Thomas Richard	Bowers Mills	Lawrence
*Carter, James M	Worcester	Audrain
Caskey, John James Karr	Columbia	Boone
Chinn, Ota	Wakenda	Carroll
Clabaugh, Emmett	LaMonte	Pettis
*Coates, Thomas Barnes	Meadville	Linn
Coil, James Hubert	Perry	Ralls
Coleman, Harry T.	Orrville	St. Louis
Combs, Joseph Craig	Linneus	Linn
Cooper, O. C.	Columbia	Boone
*Creason, Goodwin	Centralia	"
*Creelius, Harry A.	Mehlville	St. Louis
Darnaby, Alice	Columbia	Boone
Darnaby, Lena	"	"
*Darnaby, W. S.	"	"
Davis, George Thomas	Sheldon	Vernon
Dodson, Anna	Berryville, Ark.	
Donnohue, Belle	Columbia	Boone
*Duncan, C. B.	Olney	Lincoln
Dunn, Wm. Victor	Bethany	Harrison
Estes, B.	Columbia	Boone
*Estes, Charles E.	Fairport	DeKalb
Evans, Iva	North Kan. City	Clay
*Feland, Sanford	Wallace	Buchanan
*Fellows, David Crockett	Weston	Platte
*Freeze, Edwin	Dadeville	Dade
Fuller, Mary	Bethany	Harrison
*Gabbert, Lewis Cass	New Market	Platte
*Garrard, Robert	Columbia	Boone
Gerling, August	"	"
*Gillaspie, W. Augustus	"	"
Gladney, Albert	Auburn	Lincoln
Goldsberry, Willard	Dripping Sp'gs.	Boone
*Grandy, Lew Herbert	Columbia	"
Granger, Clyde	St. Louis	"
Grossman, Roy	Rocheport	Boone
Gustin, Charles	Edgerton	Platte
Guthrie, Robert Maury	Josephsville	St. Charles
Hackney, Thomas B. rton	Urich	Henry
Harris, Maurice Brown	Deer Park	Boone
Harrison, Cora	Bethany	Harrison
Harrison, Grace	"	"
*Hazlett, O.	Buffalo	Dallas
Herrnleben, Henry	Jamestown	Moniteau
Hill, W. Thomas	Latham	"
Hummel, Ellis	Carterville	Jasper
*Hutchison, Guy Reed	Carthage	"
*Jeans, W. V.	Price's Branch	Montgomery
Kasel, August Chas.	Dundee	Franklin
*Kinder, Lyman	Marble Hill	Bollinger
*King, Roy	Linn Creek	Camden
Krummel, Edward Watson	Granville	Monroe
Laughlin, W. N.	Foster	Bates
Lear, Norman J.	Hannibal	Marion
*Lester, W.	Marionville	Lawrence
Lewis, Henry	Jefferson Bar	St. Louis
Lockridge, A.	Meadville	Linn
*Lombar, Frederic E.	Iberia	Miller
Mahan, Maria	Columbia	Boone
Marshall, Archie M.	"	"
Marshall, L. J.	"	"
Martin, Henry Austin	Moberly	Randolph
*Massengale, James Rhea	St. Louis	"
McAlister, Andrew Walker	Columbia	Boone
McBurney, Henry Grier	Trenton	Grundy
McConathy, Harry	Columbia	Boone
McGwire, Morris Spencer	"	"
Merriwether, John Davis	Eolia	Pike
Mikel, Henry	Columbia	Boone
Miller, A.	Shelbina	Shelby

Name.	Postoffice.	County.
Miller, W. A.	Rocheport	Boone
Minter, M.	Mill Grove	Mercer
*Mitchell, Robert	Columbia	Boone
Mockbee, Chas. Robertson	Hornie	Jefferson
*Moody, Whit H.	Ellenorah	Gentry
*Moore, George	Phelps	Lawrence
Moore, G.	Linneus	Linn
*Moore, John Sidney	Pueblo, Colo.	
*Moore, Robert	Linneus	Linn
Moore, W. C.	Viola	Stone
Moorman, Oscar W.	Maysville	DeKalb
Moss, Hubert	Fayette	Howard
Mountjoy, John Leroy	Columbia	Boone
Meyersieck, Oscar	Union	Franklin
*Napton, John B.	Drexel	Cass
Noggle, J. Ransom	Unionville	Putnam
*O'Connell, John Patrick	St. Louis	
Oldham, S. E.	Columbia	Boone
Orr, Hattie B.	Mt. Vernon	Lawrence
*Parker, P.	Kansas City	Jackson
*Peake, George R.	Kansas City	"
Posey, John Lester	Missouri City	Clay
*Pratt, John Keiser	Columbia	Boone
Prince, Rubey A.	Rocheport	"
Ridgway, Robert Foster	Johnson City	St. Clair
Robbins, James Kingan	New Madrid	New Madrid
Robinson, Edward Windsor	Jefferson Bar	St. Louis
*Rogers, John S.	Palmvra	Marion
Russell, Earnest Howard	California	Moniteau
Sanders, James Levi	Memphis	Scotland
Schnecko, Robert Chas.	Clayton	St. Louis
Shafer, Arthur Byron	Nevada	Vernon
Sheetz, Edwin Rucks	Chillicothe	Livingston
Shepherd, Chas. M.	Clarksburg	Moniteau
Sims, John Harrison	Hazen	—, Arkansas
Slaughter, James Agnew	Edina	Knox
Smiley, B. Frank	Whiteside	Lincoln
Smith, Edmon Kirby	Charleston	Mississippi
*Smithpeter, Chas. W.	Buffalo	Dallas
Srattton, Myron A.	Windsor	Henry
Stull, Josiah Harrison	Excelsior	Morgan
Stull, Thomas Grath		
*Sturgis, James Emerson	Hamilton	Caldwell
*Sturgis, W. Eber	Perrin	Clinton
Sutherland, Virginia	Houston	Texas
Swift, A. D.	Jefferson City	Cole
Switzler, C. T.	Columbia	Boone
Switzler, R. H.		
Terrill, Anna Coates	Moberly	Randolph
Thomas, Wm. Harry	Hillsboro	Jefferson
Thomson, George Edward	Columbia	Boone
Thompson, Guy Atwood		
*Thompson, Frank F.	Bellefonte	Pulaski
Tindall, Seth Thomas	Columbia	Boone
Toalson, Omer A.	Urich	Henry
*Trumbo, Ernest George	Winston	Daviess
Turner, Levi Spurgeon	Moberly	Randolph
Turner, O. H.	Hallsville	Boone
Uhlman, Louis	St. Joseph	Buchanan
Vivion, James Gordon	Pueblo, Colo.	
Wentworth, Orris F.	Unionville	Putnam
Wheeler, C. M.	Norborne	Carroll
Wheeler, A. O.	St. Louis	
*Wyatt, Wm. S.	Cyrene	Pike
Wigginton, Cora	Columbia	Boone
*Wood, David Perry	Platte City	Platte
Wood, John H.	Strother	Monroe
*Yeaman, M. B.	Ferguson	St. Louis
Young, Chas. Everett	Mound City	Holt
Young, Frederick	Columbia	Boone
Zaring, Lizzie	Deer Park	"
Zick, Bernard	Pleasant Hill	Cass

Name.	Postoffice.	County.
SPECIAL STUDENTS.		
Defoe, Luther Marion.....	California.....	Moniteau.....
Delmore, Thomas Edward.....	Moberly.....	Randolph.....
*Ficklin, W. H.....	Columbia.....	Boone.....
Fulks, E. B.....	California.....	Moniteau.....
Goodding, Nettie Eugenia.....	Columbia.....	Boone.....
Horn, Katherine.....	Boonville.....	Co per.....
Hutchison, F. P.....	Jamesport.....	Daviess.....
Johnston, Eva.....	Columbia.....	Boone.....
Kemp, George Ward.....	Salida, Colorado.....	Boone.....
Long, Laura V.....	Columbia.....	Boone.....
Pratt, Chas. Wm.....	".....	".....
Tate, James B.....	Liberty.....	Clay.....
Torbit, Chas. Larimore.....	Rocheport.....	Boone.....
White, Benjamin Thompson.....	Perry.....	Ralls.....
Wright, M. B.....	Columbia.....	Boone.....
Zaring, Emma Lee.....	Deer Park.....	".....

-16

STUDENTS IN COLLEGE OF AGRICULTURE.

(Students taking the full course of study.)

Anderson, S. J.....	Columbia.....	Boone.....
*Beall, H.....	Coloma.....	Carroll.....
*Bihr, S. W.....	Columbia.....	Boone.....
Bretz, Wm. S.....	".....	".....
Brown, E. B.....	Kansas City.....	Jackson.....
*Brown, George Batterton.....	Springfield.....	Greene.....
*Buchanan, Frank S.....	Carrollton.....	Carroll.....
*Bulla, Wm. Henry.....	Empire Prairie.....	Andrew.....
Carpenter, M. L.....	Cameron.....	Clinton.....
Conner, Benjamin F.....	Columbia.....	Boone.....
*Conover, C. C.....	Peculiar.....	Cass.....
*Daniel, George E.....	Thompson.....	Audrain.....
Downing, Chas. M.....	Newark.....	Knox.....
Doyle, P. Harvey.....	Clinton.....	Henry.....
Duemler, James Edwin.....	St. Clair.....	Franklin.....
East, Chas. Wheeler.....	Troy.....	Lincoln.....
Ellis, C.....	Ashland.....	Boone.....
Fulton, Leonard.....	Harrisonville.....	Cass.....
Gates, Wm. C.....	Moutrose.....	Henry.....
Gordon, Reverdy Johnson.....	Columbia.....	Poone.....
Graham, Chas. Ricketts.....	Mexico.....	Audrain.....
Haferkamp, Edward Wm. Herman.....	Augusta.....	St. Charles.....
Hail, Austin Wm.....	Belton.....	Cass.....
Hamilton, A. L.....	Waverly, Ill.....	".....
Hickman, Fannie.....	Slater.....	Saline.....
Hickman, Thaddeus Bryan.....	Columbia.....	Boone.....
Hickman, Thomas Harvey.....	".....	".....
*Huntley, George.....	Farber.....	Audrain.....
Jennings, Rena May.....	Columbia.....	Boone.....
Jennings, John Robert.....	".....	".....
Johnson, Frank L.....	".....	".....
Kaser, V. C.....	Greensburg.....	Knox.....
*Lanning, John Henry.....	St. Genevieve.....	St. Genevieve.....
Lamar, Robert S.....	Fulton.....	Callaway.....
Lester, W. F.....	Marionville.....	Franklin.....
Lillard, A. C.....	Carrington.....	Callaway.....
Lillard, Doria.....	".....	".....
Lillard, G.....	".....	".....
Lyman, R. E.....	Columbia.....	Boone.....
Maxwell, Robert Wm.....	Millersburg.....	Callaway.....
McBurney, C.....	Trenton.....	Grundy.....
McConathy, Henry.....	Columbia.....	Boone.....
McGavock, Robert E.....	".....	".....
McMurry, W. M.....	Colony.....	Knox.....
Mitchell, Harrie Ray.....	Spencerburg.....	Pike.....
*Moore, W. R.....	Vandalia.....	Audrain.....
*Murrill, George R.....	Cabool.....	Texas.....
Norfleet, Robert Arthur.....	High Point.....	Moniteau.....
Palmer, W. C.....	Points.....	Boone.....
Phillips, Mary Annie.....	Dripping Sp'gs.....	Boone.....
Phillips, John Henry.....	".....	".....
Pierce, James Harris.....	Columbia.....	".....
Powell, Herman C.....	".....	".....
*Schnebly, John Henry.....	Gorin.....	Scotland.....
Schwabe, Rachel.....	Columbia.....	Boone.....

Name.	Postoffice.	County.
Schwabe, Ida	Columbia	Boone
Sears, A. J.	Barnett	Morgan
*Seger, John C.	Blackwell	St. Francois
*Smith, August	Hermann	Gasconade
Smith, Chas. E.	Columbia	Boone
Smithpeter, E. Z.	Bogard	Carroll
Swindler, Henry Byrd	Ash Grove	Greene
Tandy, John Lewis	Columbia	Boone
Thomas, Thomas	Edgerton	Platte
Thompson, Edgar S.	Brown's Sta.	Boone
Truitt, S. W.	Millersburg	Callaway
*VanCleve, Arthur	Malden	Dunklin
Waters, John Joseph	Columbia	Boone
Weeks, Edson C.	Eldon	Miller
Woodruff, Robert Lee	Orrick	Ray
*Wyatt, Marcus Wm.	Rockport	Atchison

*Special Students from other Departments Taking
One or More Studies in this College.*

-71

Adams, Arthur	Buckner	Jackson
Adams, Thomas Barrett	Norborne	Carroll
Adams, Vinnie	Shelbina	Shelby
Allen, Mary Swepson	Columbia	Boone
Barnett, John Sanford	"	"
Barnett, Sentiny Rives	"	"
Beazley, Lewis Craig	Seymour	Webster
Blackwell, Laura	Columbia	Boone
Broadhead, Marion Gertrude	"	"
Briegleb, Chas. Ferdinand	St. Clair	Franklin
Burks, David F.	Columbia	Boone
Burnham, Edna	"	"
Burnham, Nannie	"	"
Busby, Wm. G.	Wakenda	Carroll
Carpenter, L.	Cameron	Clinton
Chamberlain, Lewis Anthony	Harnie Station	Jefferson
Coleman, Wm. Orange	Milo	Vernon
Colley, Thomas Richard	Bowers Mills	Lawrence
Conley, Minnie	Columbia	Boone
Conley, Rosa	"	"
Conner, Maria	"	"
Cooper, O. C.	"	"
Culbertson, Jerry	Shobe	Bates
Darnaby, Lena	Columbia	Boone
Darnaby, W. S.	"	"
Davis, George Thomas	Sheldon	Vernon
Dawes, H. M.	Marshall	Saline
Delmore, Thomas Edward	Moberly	Randolph
Dinsmoor, Gordon	Kirkville	Adair
Dodson, A. E.	Columbia	Boone
Donnohue, Belle D.	"	"
Doty, Augustus Henry	Jamesport	Daviess
Douglass, Urma	Midway	Boone
Doyle, John Harrison	Tina	Carroll
East, Chas. W.	Troy	Lincoln
Edmonds, Anna L.	Columbia	Boone
Ellis, C.	Ashland	"
Estes, Chas. E.	Fairport	DeKalb
Evans, Amanda	N. Kansas City	Clay
Feland, Sanford	Wallace	Buchanan
Faris, John C.	Rocheport	Boone
Fewsmith, Hettie	Columbia	"
Fuller, Mary	Rethany	Harrison
Gearheard, Arthur	Sheldon	Vernon
Garrard, Robert H.	Columbia	Boone
Gillespie, Wm. Augustus	"	"
Gilliam, Lucy	Brunswick	Chariton
Goldsberry, W.	Dripping Springs	Boone
Goodnight, Thomas C.	Montserrat	Johnson
Gordon, Rachel	Jefferson City	Cole
Graham, Chas. Ricketts	Mexico	Audrain
Gremp, Wm. A.	Vienna	Maries
Griffin, Flora	Columbia	Boone
Griffin, Maude	"	"
Grossman, Roy	Rocheport	"
*Guthrie, Robert Maury	Josephsville	St. Charles
Gwinn, Arthur	Sprague	Bates
Harriss, Orlenne	Brown's Rock	Chariton

Name.	Postoffice.	County.
Harris, Maurice Brown	Deer Park	Boone
Hatton, Carrie Joanna	Columbia	"
Hoffman, Gustave	Boeger's Store	Osage
*Holman, Jurney Hubert	Hartford	Putnam
Holmes, A.	Hannibal	Marion
*Hummell, E	Carterville	Jasper
Hutchinson, Frank Prosser	Jamesport	Daviess
*Jeans, Wm.	Price's Branch	Montgomery
*King, Ray	Linn Creek	Camden
Laughlin, Wm. M.	Foster	Bates
Laws, Lena	Columbia	Boone
*Letchworth, Thomas Jefferson	Versailles	Morgan
*McBurney, Henry Grier	Trenton	Grundy
McClement, Isabella	Butler	Bates
*McConathy, Harry	Columbia	Boone
McGavock, Robert	"	"
Mahan, Maria Lou	"	"
Maoring, John	McFall	Gentry
Maxwell, Wm. Robert	Millersburg	Callaway
Merriweather, John Davis	Eolia	Pike
Mikel, Henry F.	Columbia	Boone
Miller, Olga	Shelbina	Shelby
Miller, Mary	"	"
Moorman, Oscar Wm	Maysville	DeKalb
Moore, G	Linneus	Linn
*Morro, Wm. C.	Viola	Stone
*Moss, Hubert	Fayette	Howard
Myerseck, Erwin	Union	Franklin
*Noggle, J. Ransom	Unionville	Putnam
Nordleet, Abraham L	High Point	Moniteau
Oliver, Mary	Brown's Station	Boone
Posey, John Lester	Missouri City	Clay
Powell, Bessie	Columbia	Boone
Prince, Alpha R.	Rocheport	"
Ray, Frank O.	Kansas City	Jackson
Rees, Minnie	Columbia	Boone
Riggs, Inez Lucretia	Curryville	Pike
Riggs, Mary	Hallsville	Boone
*Robinson, Edward Windsor	St. Louis	"
Robinson, Marie Annie	Stephens Store	Callaway
Rouner, A. W.	Newark	Knox
Sams, Wm. Meade	Kansas City	Jackson
Sanders, James Levi	Memphis	Scotland
Sanderson, Sarah	Rich Hill	Bates
Sankey, Paul Hastings	Salem	Dent
Schn-ecko, Robert C.	Clayton	St. Louis
Shull, Rena May	Edgerton	Platte
Slaughter, James Agnew	Edina	Knox
Smiley, B. Frank	Whiteside	Lincoln
Smith, Camill	Columbia	Boone
Smith, C. E.	"	"
*Smith, C. O.	Rich Hill	Bates
*Smith, Edmond Kirby	Charleston	Mississippi
Striker, Herbert	Marshall	Saline
*Sturgis, James Emerson	Hamilton	Caldwell
Switzler, C. T.	Columbia	Boone
Switzler, R. H.	"	"
Tapley, Mattie	Frankford	Pike
Terrill, Annie Coates	Moberly	Rando'ph
*Thomas, Wm. Harry	Hillsboro	Jefferson
*Thompson, Benjamin	Columbia	Boone
Thomson, George Edward	"	"
*Torbit, C. L.	Rocheport	"
Treadway, Herbert	Paynesville	Pike
*Uhlman, Lewis	St. Joseph	Buchanan
VanHorne, May	Columbia	Boone
Veach, S. J.	Utopia, Kas.	"
Via, Mav	Columbia	Boone
Weber, Christina	Moundville	Vernon
White, James P.	Franklin	Howard
Williamson, Wm. Harvey	Ham's Prairie	Callaway
*Woodside, Roy C.	Salem	Dent
Wright, Blanche M.	Columbia	Boone
Young, Frederick	"	"
Zaring, Emma	Deer Park	"
Zaring, Lizzie	"	"

Name.	Postoffice.	County.
NORMAL STUDENTS.		
Adams, Mary	Bowers Mills	Jasper
Adams, Vinnie	Shelbina	Shelby
Adams, Newton T.		
Armstedt, Herman Benjamin	St. Charles	St. Charles
Angle, Ernest E	Clinton	Henry
Asendorf, George Wm. Henry	Craig	Holt
Baldwin, Carrie E.	Mexico	Audrain
Baumgartner, Georgia	Columbia	Boone
*Bear, A. S.	Tipton	Moniteau
Beasley, Irene B.	Columbia	Boone
Beasley, Edgar Fountain		
Botts, Cassandra	Molina	Audrain
Boyer, Monta Jeane	Denver, Col.	
Braiford, A.	Columbia	Boone
Brockenbrough, M. B.	Hallsville	
Briegleb, Charles Ferdinand	St. Clair	Franklin
Bronson, H. H.	Sedalia	Pettis
Brown, George L.	Reynard	Bates
*Buffington, S. A.	Salisbury	Chariton
Burnham, Sallie	Columbia	Boone
Burnham, Nannie		
Butcher, Laura		
Caldwell, Robert Lee	Weatherby	DeKalb
Campbell, John A.	Avilla	Jasper
Conley, Rosa	Columbia	Boone
*Conley, M. R.		
Conner, Maria K.		
*Cook, Sidney Francois	Clarksburg	Moniteau
*Culbertson, Jerry	Shobe	Bates
*Dawes, H. M.	Marshall	Saline
Denny, James Milton	Roanoke	Howard
*Dillon, John Wm. Sherman	Denver	Worth
Douglass, Urma	Midway	Boone
Douglass, Evalena		
Doyle, John Harrison	Tina	Carroll
*Duon, John Jay	Jameson	Daviess
Edmonds, Lillian	Columbia	Boone
Evans, Amanda	N. Kansas City	Clay
*Fellows, John N.	Weston	Platte
Fewsmith, Hettie Joy	Columbia	Boone
Fuller, Mary	Bethany	Harrison
Gates, James M.	Montrose	Henry
Gerling, Henry Joseph	Columbia	Boone
*Glaves, E. C.	Tolona	Lewis
Goldsberry, W.	Dripping Sp'gs.	Boone
Gordon, Rachel	Jefferson City	Cole
Grandy, Lew Herbert	Columbia	Boone
Griffin, Maude		
Griffin, Flor		
Gwinn, Arthur	Sprague	Bates
Hack, Mary	Columbia	Boone
Hamilton, Edward Richard		
Hancock, Alice	Keytesville	Chariton
Harris, Herman Freeman	Columbia	Boone
Harris, Orienne	Brunswick	Chariton
Hart, Harry G.	High Point	Moniteau
Hatton, Moses W.	Farmington, Ia.	
Hickman, Thomas Harvey	Columbia	Boone
Hickman, Thaddeus Bryan		
Hill, George Washington	Rocheport	
Hill, Thomas W.	La'ham	Moniteau
Hoffman, Gustave A.	Boeger's Store	Osage
*Holman, Jurney Hubert	Hartford	Putnam
Horn, Katherine	Boonville	Cooper
*Hudgins, Warren Thomas	Mooreville	Livingston
Jacobs, Leila	Midway	Boone
*Keener, Frederick Dent	Fairport	DeKalb
Koehl, Anton John	Malrse, Ill.	
*Lamar, Robert Spencer	Fulton	Callaway
LaMotte, John Harry	Roanoke	Howard
Laws, Lena	Columbia	Boone
Letchworth, Thomas Jefferson	Versailles	Morgan
Lockridge, Alberta	Meadville	Linn
Long, Laura	Columbia	Boone
Lynch, Dora		
Mansfield, Mary	St. Louis	

Name.	Postoffice.	County.
Mason, Wm. E.	Berlin.	Gentry
McClement, Isabelle	Badler.	Bates
*McHenry, E. H.	Clyde.	Nodaway
McKinley, Gertrude	Windsor	Henry
*McKinney, Eber F.	Linnville	Mercer
Miller, Mary	Shelbina	Shelby
*Moore, Harry Lancaster	Pueblo, Col.	
Norfleet, Abraham L.	High Point.	Monteau
Norfleet, Viola		
Pennington John Wm	Bosworth	Carroll
Phillips, James Preston	Golden City	Barton
Powell, Elizabeth	Columbia	Boone
Riehl, Mary	Potosi	Washington
Riggs, Mary	Hallsville	Boone
Robert, Josephine	Moberly	Randolph
Robinson, Annie	Stephens Store.	Boone
Robinson, C	Deer Park.	"
Rouner, A. W	Newark	Knox
Sanderson, Sarah	Rich Hill	Bates
Sams, Wm. Meade	Kansas City	Jackson
Sears, Phidelia	Barnett	Morgan
Selsor, Mark	Madelaine	Davless
Shull, Rena M	Edgerton	Platte
Smith, Zimri Carter	Pine Valley	Reynolds
Smith, Hugh A.	Coalsburgh	Henry
Smith, C. O	Rich Hill	Bates
Stemmons, Mattie	Maple Grove	Jasper
*Swindler, Henry Byrd	Ash Grove	Greene
Terpening, Minnie	Moundville	Vernon
Toalson, Omar A.	Urich	Henry
Via, May	Columbia	Boone
Williams, David Edgar	Conway	Laclede

—108

Teachers' Course

Brandt, E. J	Warrenton	Warren
Campbell, Edward Eugene	Chain of Rocks	Lincoln
Coleman, Wm. Orange	Milo	Vernon
Conley, Minnie	Columbia	Boone
Faris, John C.	Rocheport	"
Gearheard, Arthur	Sheldon	Vernon
Gillam, Lucy	Brunswick	Chariton
Griffin, Florence	Cairo	Randolph
Hatton, Carrie Joanna	Columbia	Boone
Horning, Clotilda	Springfield	Greene
Norfleet, Abraham L.	High Point	Monteau
Oliver, May	Brown's Station	Boone
Skaggs, W. L	DeSoto	Jefferson
Tapley, Mattie	Frankford	Pike
Van Horne, May E.	Columbia	Boone
Weber, Christina	Moundville	Vernon

—16

*LAW STUDENTS.**MASTER'S CLASS.*

Kemp, George W.	Salida, Colo.	
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SENIOR CLASS.

*Allen, James A.	Lamar	Barton
Beach, A. W.	Helena, Mont.	
Blake, Frank	Kansas City	Jackson
Bruce, George Washington	Columbia	Boone
Dunkin, Robert Roy	Browning	Linn
Farley, Robert Emmett	Columbia	Boone
Fulkerson, Frank B.	Higginsville	Lafayette
Hart, Henry G.	Slater	Saline
Herndon, Harry T.	Platte City	Platte
Hinkle, John Isaac	Boles	Franklin
Locker, Wm. Henry	Duval	Barton
Manning, A. V.	Tiff City	McDonald
Mayfield, Irwin Washington	Columbia	Boone
Mayfield, Leander C.	Lebanon	Laclede
Minton, Chas.	Cape Girardeau	Cape Girardeau
Moyer, Linneus Edward	Des Moines, Ia.	
O'Donahue, James J.	St. Louis	
O'Mahoney, C.	Columbia	Boone

Name.	Postoffice.	County.
Pogue, Henry F.	Palo Pinto	Benton
*Robinson, Omar Edward	Rockville	Bates
Rodgers, Robert D.	Benton City	Audrain
Ruark, Horace C.	Neosho	Newton
Rudy, Luther	Mt. Lebanon, La	
Schaper, Jesse Herman	Troy	Lincoln
Talbot, Demetrius Wm.	Oklahoma, O. T	
Thompson, Burton Maude	Columbia	Boone
Tipton, Joseph C., A. B.	Las Vegas, N.M.	
Toalson, Oscar Benton	Urich	Henry
Willis, John S.	Columbia	Boone

-29

JUNIOR CLASS.

Banks, John S.	Columbia	Boone
Barnet, O. M.	Edina	Knox
Barr, Guy C.	St. Joseph	Buchanan
Beach, Emory Vivian	Helena, Mont.	
Bishop, John Edward	California	Monteau
Blackwell, Wm. Arthur	Pattonville	St. Louis
Bond, Sam.	St. Mary's	Ste. Genevieve
*Botts, Hosea Thompson	Novelty	Knox
Bradley, N. M.	Warrensburg	Johnson
Brown, Edward	Cross Timbers	Hickory
Buckley, Wm. Dayton	Ft. Smith, Ark.	
Cravens, Wm. B.	Springfield	Greene
Corum, C. D.	Boonville	Cooper
Dempsey, Luther Nixon	Minden	Chariton
*Duncan, Jesse	Olney	Lincoln
Felker, Henry C.	Vienna	Maries
Garrett, Corydon	Cottonwood	Femiscot
Gerig, Edward	Columbia	Boone
Gerling, Henry Joseph		
Glasscock, Henry	New London	Ralls
Goodrich, John Edward	Cameron	Clinton
Groves, Hiram John	Dover	Lafayette
Hayes, Thomas A.	Kirksville	Adair
Holmes, A. S.	Hannibal	Marion
Landers, Henry P.	Brookfield	Linn
Loeb, Isador	Columbia	Boone
McCurdy, George Vest	Sedalia	Pettis
Murray, Jerry Herbert	McCredie	Callaway
Ray, Fred. P.	Kansas City	Jackson
Rogers, E.	Columbia	Boone
Schooling, B. Gratz	Milan	Sullivan
Sparrow, Wm. S.	Vaudalla	Audrain
Strother, S. B.	Kansas City	Jackson
Timberlake, E. M.	Warrenton	Warren
Ward, Robert Emmett	Birmingham	Clay
Williams, Joseph Green	Hillsboro	Jefferson

-36

MEDICAL STUDENTS.

FIRST YEAR'S CLASS.

*Baker, Chas. M.	Paris	Monroe
Belden, Wm. Everett	Columbia	Boone
Bradley, Thomas	Warrensburg	Johnson
Brown, Hugh Ernest	Brown Station	Boone
Cox, Sylvester	Wellsville	Montgomery
Diven, John H.	Centralia	Boone
Diven, Thomas Harry		
Graham, Robert	Clarks, Ohio	
*Green, David E.	Platte City	Platte
Grepp, Wm. A.	Vienna	Maries
Huater, W. C.	Trenton	Grundy
Kurtz, R. L.	Columbia	Boone
Martin, Wm. R.	Martinsburg	Audrain
McQuitty, James Wm.	Midway	Boone
*Parmer, John E.	Columbia	
*Peelor, Edward C.	Brownington	Henry
Quinn, Abram Turner	Columbia	Boone
Reed, Oscar Davis	Tulip	Monroe
*Schrutcheild, Guthrie	Macon City	Macon
Son, Edwin Robert	California	Monteau
Smith, Harry C.	Hughesville	Pettis
Wade, Sidney Johnston	Benton	Scott
West, Wm. Dan.	Mendon	Chariton
Williamson, Wm. Harvey	Columbia	Boone

Name.	Postoffice.	County
Wilson, Guy.	Columbia	Boone
Winn, James Warren	Meyers	Howard
Yager, Sam	Perche	Boone
SECOND YEAR'S CLASS.		-27
Cook, Richard F.	Centralia	Boone
Lockwood, Wm. Duncan	Rockport	Atchison
Thornton, Joseph E.	Rockport	Boone
Treadway, Herbert	Paynesville	Pike
Wade, Fernando Harding	Columbia	Boone
ENGINEERING STUDENTS.		-5
*Balthis, Frank Spencer	Huntsville	Randolph
Cauthorn, Edward Beauford	Columbia	Boone
*Chamberlain, Louis Anthony	Hornie Station	Jefferson
*Crecelius, S. F.	Mehlville	St. Louis
Doty, Augustus Henry	Jamesport	Daviess
*Dye, A.	Salem	Dent
Dunn, John Jay	Jameson	Daviess
Dodson, A. E.	Columbia	Boone
Dinsmoor, Gordon	Kirksville	Adair
DeGraw, Richard X	Brookfield	Linn
Elkin, Asa B.	Hallsville	Boone
Fyfer, John Kirkbride	Columbia	"
*Fowler, Thomas Robert	Sedalia	Pettis
*Gordon, Wm. Edgar	Orrsburg	Nodaway
Graham, Chas. Ricketts	Mexico	Audrain
Garrett, Robert P.	Mound City	Holt
*Griggs, Austin B.	Hedge City	Knox
Hale, W. Ben	Laddonia	Audrain
Hancock, Lyman Ernest	Stanley	Johnson
Hunter, Thomas Edwin	Raytown	Jackson
*Highley, Lee		Madison
Hill, Curtis	Independence	Jackson
*Hatcher, Morris Simon	Columbia	Boone
*Keiser, Chas. Frank	Clinton	Henry
Lockwood, Marquis H.	Rockport	Atchison
Lawrence, A. W.	Bowling Green	Pike
McCrary, W. L.	Chifton Hill	Randolph
Mockbee, Chas. Robertson	Hornie	Jefferson
Murray, Grant	Savannah	Andrew
Miller, George Edward	Weldon Spring	St. Charles
Merriwether, John Davis	Eolia	Pike
*May, David E.	Warrensburg	Johnson
Newton, Ned Ernest	Bolivar	Polk
Noggle, J. Ransom	Unionville	Putnam
*Parker, P.	Kansas City	Jackson
Roper, Wm.	Nichols	Greene
Striker, Herbert	Marshall	Saline
Schnecko, Robert C.	Clayton	St. Louis
Shawhan, Daniel	Lone Jack	Jackson
Sankey, Paul Hastings	Salem	Dent
Sanders, James Levi	Memphis	Scotland
*Shipman, Robert	Holden	Johnson
*Thompson, Thomas Waddy	Perdleton	Warren
*Truitt, C.	Columbia	Boone
*Talbert, Chas. Mason	Cassville	Barry
Turner, O. H.	Hallsville	Boone
Uhlmann, Louis	St. Joseph	Buchanan
Veach, S. J.	Utopia, Kansas	
Wheeler, A. O.	St. Louis	
Young, Chas. Everett	Mound City	Holt
		-50

* Members of Cadet corps.

STUDENTS OF SCHOOL OF MINES.

Name.	Postoffice.	County.
RESIDENT GRADUATES.		
Millard, Sallie E	Rolla	Phelps
UNDER-GRADUATES.		
Alexander, George Ernest	Marville	Nodaway
Alexander, Thompson	Muldrow, Ind. T.	Phelps
Allen, Anna Artemesia	Rolla	Phelps
Attebery, Minnie	Cuba	Crawford
Barker, Jacob Forney	Carthage	Jasper
Bland, Richard E	Rolla	Phelps
Boas, Fannie	"	"
Buskett, Evans W.	"	"
Buskett, Mary Page	"	"
Clayton, Frank Ray	St. Louis	Phelps
Corse, Lottie Edith	Rolla	Phelps
Detweiler, Ora	Dry Knob	Laclede
Dwyer, Edward P.	Joplin	Jasper
Dyer, T	Rolla	Phelps
Ettmüller, Otto	Hermann	Gasconade
Florreich, P.	St. Louis	"
Fort, Edward Long	Rolla	Phelps
Fox, Homer Hastings	St. Louis	"
Germann, Frank A	Rolla	Phelps
Goodwin, Anna G	"	"
Greenzweig, A. H.	"	"
Grove, C. D	Gallatin	Daviess
Grover, Carrie B.	Cuba	Crawford
Guenther, Eda	Rolla	Phelps
Henderson, Harry P	St. James	"
Herdman, George W.	Neosho Falls Kan	"
Jackling, D. D	Sedalia	Pettis
Jackson, J. M.	Albuquerque, N.	M
Jamison, Blanche	Rolla	Phelps
Johnson, Edward Mackay	"	"
Johnson, L. L.	Independence	Jackson
Jones, Fayette A	St. Louis	"
Jones, Harry I.	Knob Noster	Johnson
Kelly, Chas. M.	Springfield	Greene
Kelso, Thaddeus Sands	St. Louis	"
Kerr, Wm. Christian	Starke, Fla.	"
Kachelhofer, J. M.	Rolla	Phelps
Lepper, Jennie Edith	St. Louis	"
Lewis, Harry E.	Iberia	Miller
Lombar, Frederick E.	Independence	Jackson
Lowe, Parker Lee	Rolla	Phelps
Lunbeck, George A.	"	"
McCaw, Margaret	Hillsboro	Jefferson
McMullin, Richard W.	Lebanon	Laclede
Manning, Harvey E.	Sullivan	Franklin
Martin, Grace	Rolla	Phelps
Meriwether, C.	"	"
Millard, Linna	"	"
Mitchell, W.	"	"
Morris, Joseph Evans	"	"
Morrow, S. L.	Ft. Smith, Ark.	"
Nicholson, A. P.	Ft. Worth, Tex.	"
Nicholson, Ross	"	"
Northrip, Joseph R	Stoutland	Camden
Oatley, John Arthur	Rolla	Phelps
Parker, Morris Brown	White Oaks, N.	M
Patterson, Oscar F.	Lebanon	Laclede
Patterson, W. M.	Ree Heights, S. D.	"
Phariss, Ida	Rolla	Phelps
Reid, John C.	Pleasanton, Kas.	"
Richardson, E.	Rolla	Phelps
Richardson, Grace	"	"
Rowden, Wm. E.	Stoutland	Camden
Sappenfield, Estella E.	Rolla	Phelps
Sappenfield, Olive	"	"
Smith, Tennie E.	"	"
Soest, Adele	"	"
Southgate, Margaret B.	"	"

Name.	Postoffice.	County
Spencer, C. B.	Joplin.....	Jasper.....
Spencer, Herbert G.	".....	".....
Stephenson, Lulu E.	Rolla.....	Phelps.....
Stern, W. E.	".....	".....
Strobach, Minnie.....	".....	".....
Tallman, Blanche.....	".....	".....
Thomas, Wm. Stephens	Bevier.....	Macon.....
Torrence, L. C.	Pocahontas	Cape Girardeau.
Tyrrell, Frank L.	Sinkin.....	Shannon.....
Vaughan, Robert Edward Lee.....	Salem.....	Dent.....
Walker, John E.	Vichy.....	Maries.....
Weisenbach, Addie Marguerite.....	Rolla.....	Phelps.....
Wood, Arthur Edward.....	".....	".....
Zelch, John A.	Clayton.....	St. Louis.....

-83

SUMMARY.

<i>Academic Students—</i>	<i>Professional Students—</i>
Post-graduates..... 2	Agr'l and Mech'l { <i>a</i> , Regular.... 71
Seniors..... 18	{ <i>b</i> , Special..... 134
Juniors..... 26	Normal { <i>a</i> , Regular..... 108
Sophomores..... 36	{ <i>b</i> , Teachers' course.... 16
Freshmen..... 98	Law..... 66
Preparatory..... 164	Medical..... 32
Special..... 16	Engineering..... 49
Total..... 360	Military Science and Tactics..... 193
	Mining and Metallurgy..... 83
	Total..... 749
	Grand total..... 1109
	Names counted more than once.... 395
	No. of individual students..... 714

ENROLLMENT.

1. Academic Departments.

<i>a. Language.</i>	No. Students.	<i>b. Science.</i>	No. Students.
1. English.....	439	1. Metaphysics.....	2
2. Latin.....	302	2. Mathematics.....	394
3. Greek.....	107	3. Physics.....	280
4. Modern Languages.....	270	4. Chemistry.....	344
5. Hebrew.....	3	5. Geology and Mineralogy.....	104
6. Sanskrit.....	3	6. Biology.....	229

2. Professional Departments.

	No. Students.		No. Students.
1. Agriculture and Mechanic Arts.....	205	5. School of Mines and Metallurgy...	83
2. Normal Instruction.....	124	6. Engineering.....	52
3. Law.....	65	7. Military Science and Tactics.....	173
4. Medicine.....	32		

COUNTIES REPRESENTED IN THE UNIVERSITY.

Adair	3	Lincoln	7
Atchison	4	Lafayette	2
Andrew	7	Lewis	1
Audrain	10	Macon	2
Barton	3	Maries	3
Bates	11	Marion	6
Boone	172	Mercer	2
Buchanan	5	Miller	5
Benton	1	Morgan	5
Barry	1	Montgomery	4
Bollinger	2	Mississippi	1
Clinton	5	McDonald	1
Callaway	10	Moniteau	14
Clark	1	Monroe	7
Cooper	3	Nodaway	5
Cape Girardeau	6	New Madrid	2
Chariton	10	Newton	1
Caldwell	1	Osage	1
Cass	5	Putnam	5
Carroll	9	Pettis	9
Clay	6	Pike	8
Cole	4	Phelps	38
Camden	2	Polk	2
Crawford	2	Platte	10
DeKalb	4	Pulaski	1
Dent	5	Randolph	10
Daviess	7	Reynolds	1
Dallas	3	Ray	1
Dunklin	1	Ralls	2
Dade	1	St. Louis	10
Franklin	9	St. Louis City	16
Gentry	4	Sullivan	4
Grundy	4	St. Charles	6
Greene	5	Shannon	1
Gasconade	2	Shelby	10
Henry	13	Stone	1
Howard	7	Scott	2
Holt	4	St. Clair	1
Hickory	1	Ste. Genevieve	3
Harrison	4	Scotland	2
Johnson	7	Saline	5
Jackson	21	St. Francois	1
Jasper	9	Texas	2
Jefferson	5	Vernon	7
Knox	8	Washington	1
Lawrence	4	Warren	3
Linn	11	Webster	1
Laclede	6	Worth	1
Livingston	2	Number of counties represented	97

STATES AND TERRITORIES REPRESENTED.

Arkansas	4	Montana	2
Colorado	6	New Mexico	1
Florida	1	Ohio	2
Illinois	2	Oklahoma Territory	1
Indian Territory	2	South Dakota	1
Iowa	2	Texas	4
Kansas	4	Washington	1
Missouri	681	Total represented	15

GRADUATES OF 1891.

Academic College.

FIRST RANK WITH DISTINCTION (AVERAGE GRADE 96-100).

Joseph Francis Paxton, A. B.

FIRST RANK (AVERAGE GRADE 90-96).

Francis Pierce Divelbiss, A. B.
Henry Sanford McLeary, L. B.
Miss Leila Britt, S. B.
Robert Porter Ingram, A. B.

William Richard Gentry, L. B.
William Sampson Jennings, L. B.
Louis Napoleon B. Gray, L. B.

SECOND RANK (AVERAGE GRADE 70-90).

John Benjamin Dorman, S. B.
Joseph Luke Russell, L. B.
John Benjamin Dorman, L. B.

George Cooley Pratt, A. B.
John Harvey Hatton, A. B.

Law College (Degree of LL. B.)

BACHELOR OF LAWS (cum laude).

John S. Brown
George L. Edwards
Albert E. L. Gardner

J. Bowman Stirling
Edward J. White

BACHELOR OF LAWS.

George R. Biggs
James S. Burke
Paul N. Crews
James Gwinn
William S. Jennings
Dennis W. Kane
George Ward Kemp
William R. Littell
Robert Lee McCulloch
James P. Neal

Warren A. Parker
Hubert N. Pittman
Oscar Puckett
Aytchmonde P. Shull
William H. Sprecker
Christian C. von Grep
Hubert P. Warden
James H. Denny, Dec. 23, 1891
Charles A. Keith, Nov. 27, 1892
Arnold Manns, Dec. 31, 1892.

Engineering College.

Oliver Neal Axtell, C. E.
William Broadbudd Cauthorn, C. E.
Abraham Pinckney Ellis, C. E.
John Lockhart Haley, C. E.
Lewis Burton McKean, C. E.
Prof. Hiram Phillips, C. E.

Charles Alden Bonfils, T. E.
William B. Cauthorn, T. E.
Abram P. Ellis, T. E.
John L. Haley, T. E.
Samuel W. Shinkle, T. E.
Wm. Franklin Hall, E. E.

CERTIFICATE IN SURVEYING.

Charles M. Talbert
Curtis Hill

J. E. Bishop
Thos. A. Ficklin

Agricultural College (Degree of B. A. S.)

*Forest E. Davis**Charles M. Conner*

Medical College (Degree of M. D.)

John W. Connaway, M. D.
Paul Evans, M. D.
Elihu A. Fluesmieier, M. D.

Ossian F. Hatton, M. D.
Joseph O. Jordon, M. D.
Prof. George D. Purinton, M. D.

Dr. J. L. Corlew, Ad-eundum degree

Normal College (Degree of Pe. B.)

Miss Leila Britt, S. B.
Frank P. Divelbiss, A. B.
J. B. Dorman, S. B., L. B.
J. H. Hatton, A. B.

Robert Porter Ingram, A. B.
Joseph Luke Russell, L. B.
Louis N. B. Gray, L. B.

CERTIFICATE.

Miss Cora A. Eitzen
John Franklin Wade
Miss Emily R. Schmidt
George C. Immer
Anderson Wear Thurman
Albert T. McAdow
Miss Jennie Adams
Miss Margaret Sinclair

Miss Lillian McGhee
Miss Susan Duncan Harris
Miss Annie Johnson
Floyd Lee Weakley
Miss Bessie Belle Burk
Miss Dollie Barnett Holloway
Charles M. Howell

HONORABLE MENTION—1890-91.

All students who have finished the work of any department, and who have reached in it an average grade of 96 to 100, shall be named by the Professor in charge of such department in his annual report to the President of the University for **HONORABLE MENTION** in the catalogue; this fact of honorable mention shall likewise be stated on the Commencement programme in the case of graduates — [*From rules for grading students, adopted April, 1884.*]

DEPARTMENT OF ENGLISH.

JOSEPH FRANCIS PAXTON.

DEPARTMENT OF LATIN.

JOSEPH FRANCIS PAXTON.

DEPARTMENT OF GREEK.

JOSEPH FRANCIS PAXTON.

DEPARTMENT OF METAPHYSICS.

JOHN BENJ. DORMAN,
FRANK PIERCE DIVELBISS,
WILLIAM RICHARD GENTRY,
WILLIAM SAMPSON JENNINGS,
JOSEPH FRANCIS PAXTON.

DEPARTMENT OF MATHEMATICS AND ASTRONOMY.

FRANK PIERCE DIVELBISS.

DEPARTMENT OF MODERN LANGUAGES.

WILLIAM RICHARD GENTRY.

DEPARTMENT OF GEOLOGY AND MINERALOGY.

LEILA BRITT.

DEPARTMENT OF LAW.

JOHN S. BROWN,
GEORGE L. EDWARDS,
ALBERT E. L. GARDNER,
J. BOWMAN STIRLING,
EDWARD J. WHITE.

Prize Essayists in the Department of Law.

ALBERT E. L. GARDNER.....First prize
JOHN S. BROWN.....Second prize

The James S. Rollins University Scholarships.

These scholarships have been awarded as follows:

College of Arts, A. B. course.....M. R. CONLEY
College of Arts, S. B. course.....G. L. BROWN
College of Law.....O. A. TOALSON
College of Engineering, C. E. course.....J. N. FELLOWS

INDEX.

	Page
Absences from class and chapel.....	107
Academic departments.....	34
Academic Faculty.....	35, 36
Academic Valedictorian.....	108
Academic Courses.....	56, 57
Admission to the University—	
College of Agr. and Mech. Arts...	76
Engineering department.....	58
Freshman class.....	56
Law department.....	90, 91
Medical department.....	94
Military department.....	104
Mines and Metallurgy.....	128
Normal department.....	58
to preparatory courses.....	58
from approved High schools.....	59
Alumni.....	113
Approved High schools.....	59
Art department.....	104
Biology.....	53, 54
Board of Visitors.....	28
Boarding.....	71, 92, 109, 129
Burning of main building.....	22
Calendar of University and School of	
Mines.....	8
Certificates.....	84, 98, 103, 108, 131
Chapel services and attendance.....	107
Chemical department.....	50
Class-cards.....	107
Club-houses.....	71, 109, 129
College of Agr. and Mech. Arts—	
Admission.....	71
Courses.....	72-79
Degrees.....	77
Enrollment.....	82
Experiment Station.....	68, 81
Faculty.....	67
General information.....	21, 69, 70
Shop-work.....	73, 74
Veterinary science.....	74
Commercial department.....	17
Commercial course.....	76
Comparative Philology.....	44
Counties represented.....	147

	Page
Curators.....	28
Date of meeting.....	8
Officers.....	28
Report to Governor.....	11-27
Departments of the University.....	34
Agriculture and Mechanic Arts.....	67-82
Art.....	104
Biology.....	53, 54
Chemistry.....	50
Comparative Philology.....	44
English.....	37
Engineering.....	97-101
Geology and Mineralogy.....	51-53
Greek.....	40
Latin.....	38
Law.....	86-92
Mathematics and Astronomy.....	45-47
Medical.....	93-96
Mental and Moral Philosophy.....	45
Military.....	102-104
Mining and Metallurgy.....	117-129
Modern Languages.....	41
Normal.....	83-85
Physics.....	47, 48
Political Science.....	17, 44
Sanskrit.....	43
Semitic Languages.....	43
Degrees.....	108, 131
Directions for new students.....	107
Disciplinæ.....	103
Dress of young women.....	55
English department.....	37
Engineering department.....	97-101
Courses.....	99, 100
Faculty.....	97
Fees and enrollment.....	100
Enrollment in all departments.....	146
Examinations.....	8, 107, 130
Entrance.....	8, 107
Re-examinations.....	107
Special.....	107, 108
Faculty.....	29-33
Fees.....	108, 129
Geology and Mineralogy.....	51-53

	Page		Page
Graduates of approved High Schools..		Military department	102-104
(note)	53, 59	Admission	104
Graduates of 1891	148	Courses	103
Greek department	40	Staff	102
Historical Statement	8	State Cadets	103, 104
Honorable Mention	149	Modern Languages	41
Insurance fund	22	New buildings	23
Latin department	38	New department	83-85
Latin prize	39	Courses	84, 85
Law department	86-92	Degrees	84
Admission	90	Enrollment	85
Courses	88	Faculty	83
Degrees	91	Observatory	46
Enrollment	92	Physics department	47, 48
Faculty	86	Prizes	113
Fees	92	Professional departments	61
Opening and closing	92	Political Science	17, 44
Post-graduate Course	90	Resident graduates	109
Leases	25	Rollins Aid fund	110-112
Library	24, 105, 106, 130	Rollins Scholarships	110
Local Chapters of Alumni Association	114	Sanskrit	43
Literary societies	55, 112, 130	Semitic Languages	43
Manual Training School	19-21, 73, 74	States represented	147
Mathematics and Astronomy	45-47	Students of University	133-144
McAnally Medal	38	Students of School of Mines	145, 146
Medical department—		Subscription of people of Boone Co. ..	10, 22
Admission and courses	94	Summary	146
Degrees and fees	95	University—	
Faculty	93	Departments	34
Requirements for graduation	96	Date of opening and closing	8
Mental and Moral Philosophy	45	Founding of professional depart- ments	10
Mining and Metallurgy	117-129	New departments	15, 21
Building and Equipments	129	Students	133-144
Courses	119, 120, 128	When founded and how sustained ..	10
Degrees	131	University Extension	113
Departments	121-127	Veterinary Science	74
Expenses	129	Young women	55
Faculty and Officers	117	Young Women's Christian Association ..	112
Library	130	Young Men's Christian Association ..	112
Students	145, 146		
Ministers and students preparing for the ministry	103		

CATALOGUE

OF THE

University of the State of Missouri

FIFTY-FIRST REPORT

OF THE

CURATORS

TO THE GOVERNOR OF THE STATE.

1892-1893.



UNIVERSITY CALENDAR.

1893.

September 7, 8, 9, 11	Entrance Examinations
September 12, Tuesday	All Departments Open
September 15, Friday	Reception of Y. M. C. A. and Y. W. C. A.
October 28, Saturday	Open Session of the Athenæan Society
November 11, Saturday	Open Session of the Union Literary Society
December 9, Saturday	Inter-Society Contest
December 16, Saturday	Open Session of the Bliss Lyceum
December 21, Thursday at 4 p. m.	Christmas Holidays Begin

1894.

January 2, Tuesday at 9 o'clock a. m.	Reopening
January 20 to January 29	Mid-Year Examinations
January 30, Tuesday	Second Semester Begins
February 10, Saturday	Open Session of Young Ladies' Society
April 7, Saturday	Prize Declamation Contest
May 26 to June 4	Final Examinations
June 2, Saturday	Stephens Medal Contest
June 3, Sunday	Baccalaureate Discourse
June 4, Monday	Department of Law Closes
June 5, Tuesday	Curators Meet
June 5, Tuesday	Address before the Literary Societies
June 6, Wednesday	Oration before Alumni
June 7, Thursday	Commencement

SCHOOL OF MINES.

(AT ROLLA).

1893.

September 18, Monday, 10 a. m.	Entrance Examinations
September 19, Tuesday	First Semester Begins
November 30, Thursday	Thanksgiving Holiday
December 22, Friday	Christmas Holidays Begin

1894.

January 2, Tuesday	Exercises Resumed
January 22, Monday	Mid-Year Examinations Begin
January 27, Saturday	Mid-Year Examinations Close
January 30, Tuesday	Second Semester Begins
February 22, Thursday	Washington's Birthday Holiday
May 28, Monday	Final Examinations Begin
June 5, Tuesday	Final Examinations Close
June 7, Thursday, 10 a. m.	Commencement

1893								1894							
JULY.								JANUARY.							
S	M	T	W	T	F	S		S	M	T	W	T	F	S	
..	1		..	1	2	3	4	5	6	
2	3	4	5	6	7	8		7	8	9	10	11	12	13	
9	10	11	12	13	14	15		14	15	16	17	18	19	20	
16	17	18	19	20	21	22		21	22	23	24	25	26	27	
23	24	25	26	27	28	29		28	29	30	31	
30	31	
AUGUST.								FEBRUARY.							
..	..	1	2	3	4	5		1	2	3	
6	7	8	9	10	11	12		4	5	6	7	8	9	10	
13	14	15	16	17	18	19		11	12	13	14	15	16	17	
20	21	22	23	24	25	26		18	19	20	21	22	23	24	
27	28	29	30	31		25	26	27	28	
SEPTEMBER.								MARCH.							
..	1	2		1	2	3	
3	4	5	6	7	8	9		4	5	6	7	8	9	10	
10	11	12	13	14	15	16		11	12	13	14	15	16	17	
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HISTORICAL STATEMENT.

The University of the State of Missouri was located at Columbia, Boone county, on June 24, 1839, by commissioners appointed and empowered to select a site under an act of the General Assembly of February 8, 1839. To secure the location at Columbia, citizens of Boone county contributed the sum of \$117,900. The main building was begun in 1840, and courses of instruction in Academic work were opened on April 14, 1841. A Normal department was established by act of March 11, 1867. The next year (1868), the State gave the University aid for the first time. The College of Agriculture and Mechanic Arts and the School of Mines and Metallurgy were made a department of the University by act of February 24, 1870—the School of Mines and Metallurgy being located at Rolla. To gain this addition to the University at Columbia, citizens of Boone county contributed \$90,000. The Law department was opened in October, 1872; the Medical department in February, 1873; and the Engineering department in September, 1877. The Experiment Station was established under act of Congress of March 2, 1887. The Missouri State Military School was created a department of the University by act of the General Assembly in 1890. On January 9, 1892, the main building of the University was destroyed by fire. In the following March, the Legislature gave the University, for buildings and equipment, \$236,577; this sum included insurance on the main building, \$146,577, and a subscription of \$50,000 from citizens of Boone county. In March, 1893, the fund for buildings and equipment was increased by a second appropriation of \$264,000 (\$250,000 for a building and \$14,000 for grading, plumbing, etc.), and a special appropriation of \$25,000 additional was made for a new building at Rolla.

The foundation and the maintenance of the University rest on:

1. The old Seminary fund, \$122,000 at 6 per cent;
2. The new Seminary fund, act of March 29, 1872, \$100,000 at 5 per cent;
3. Congressional Land Grant fund, act of July 2, 1862, \$317,000 at 5 per cent;
4. The United States Experiment Station fund, \$15,000 per annum;
5. Fund from the act of Congress of Aug. 30, 1890, \$17,023 (for the year 1892-3);
6. Fifty-two thousand acres of unsold land;
7. The Anthony W. Rollins Aid fund—interest on nearly \$40,000;
8. The James S. Rollins Scholarship fund, \$6,000 at 5 per cent;
9. Various gifts by individuals as foundations for prizes;
10. Tuition and other fees;
11. Deposits in the State treasury of proceeds of partition sales (unclaimed) at 5 per cent;
12. Endowment granted by the 36th General Assembly, \$646,958.23 at 5 per cent;
13. Buildings, grounds, library and equipment, valued at \$730,000 (\$700,000 at Columbia and \$30,000 at Rolla);
14. Appropriations for specific purposes by the Legislature of the State.

These appropriations have amounted to nearly \$1,300,000 since March, 1891, but in this sum is included the amount entered above under 12. Besides providing for her University (which is the head of the Public School system) and for three Normal Schools, Missouri gives annually, for the support of her elementary schools, the third part of her total State Revenue fund. This aid from the State is added to the local school tax. These schools receive also the income at 6 per cent upon an endowment of \$2,909,000, and at 5 per cent upon an endowment of \$237,000.

NEW BUILDINGS.

The engraving accompanying this catalogue is an accurate representation of the entire group of new University buildings. Of the buildings erected in former years, it shows the College of Agriculture, and the President's house; but it does not show the Observatory, the Medical building, the three club-houses, the Agricultural Farm buildings, or the Experiment Station. The view is taken from the northwest. As you enter the campus from the north, you pass the buildings as follows: on the left, 1, the Law School (new), 2, the Chemical Laboratory (new), 3, the President's house (built some years ago), 4, the Museum (new); on the right, 1, the Agricultural College (built some years ago), 2, the Physics and Engineering building (new), 3, the Mechanic Arts building (new), 4, the Power house (new).

The new Academic Hall, as provided by the 37th General Assembly, will be located at the extreme south of the campus, and will run east and west, completely closing in the view. It will have an extreme length east and west of 319 feet. The depth of the building from north to south varies from 60 to 130 feet. The whole building will have three full stories besides a high basement, which may be counted as practically a fourth story. The tip of the dome is 180 feet above the level of the ground. The east end will contain the chapel. This will be an exact copy of the old chapel, which was one of the handsomest in America, and will seat comfortably 1,500 people. The west end will be given up to the Library, and to suites of rooms for the young women. The central portion of the building, 85×130 feet, will be devoted to lecture rooms and offices. An effort will be made to have the chapel ready by the first of June, 1894.

The Law building is $68\frac{1}{2} \times 114\frac{1}{2}$ feet, and contains two stories and a basement. On the west front there is a center tower 88 feet high.

The Chemical building, located 50 feet south of the Law building, has a frontage of 182 feet on the quadrangle, and is 90 feet deep. It will have two stories and a basement.

The Museum building has a frontage of 140 by a depth of 100 feet. It will contain two stories and a basement. The central portion is the Museum proper, 46×100 feet, entirely fire-proof, with floors of tile. The wings to the right and left of the Museum proper are for the Departments of Geology and Mineralogy on the one side, and of Botany and Biology on the other. Each of these wings will have eight rooms, in addition to a large lecture hall 23×40 feet.

The Physics and Engineering building has a frontage of 145 by a depth of 78 feet. It will have two stories and a basement, with tower at center of front 92 feet high. It will be arranged for Physics and for Civil, Mechanical and Electrical Engineering. The building will contain 32 rooms, in addition to the two lecture halls 23×40 feet.

The Mechanic Arts building has a frontage of 108 and a depth of 117 feet. It consists of two stories and a basement. It has six shop-rooms, 40×40 feet; an exhibit hall, 25×40; two offices, 16×18; one drawing department, 40×40; store rooms, engine room, etc. The driving power is furnished by a 60-horse power Corliss engine that gets its steam by pipes from the Power house. The Power house is 72×86 feet, one story (21 feet) high. At the south end is the enormous brick smoke-stack, 100 feet high. It contains a plant of four boilers aggregating 400 horse power. All buildings will be heated from this plant by a system of brick tunnels, $6\frac{1}{2}$ feet high by four broad, extending around the quadrangle and connected with each building. Through these tunnels all steam, water and gas-pipes and all electric light wires will be carried. All buildings have limestone foundations, extending to a height of five feet above grade line, with superstructure of pressed brick (trimmed with cut stone), cornices of galvanized iron, and roofs of slate. All interior division walls are of brick, all ceilings are of cement laid on steel laths, and all floors are of hard maple polished.

REPORT OF THE BOARD OF CURATORS.

To his Excellency WM. J. STONE, *Governor of the State of Missouri* :

SIR—In compliance with the provisions of section 8751 of the Revised Statutes of Missouri, 1889, the Curators of the University of the State of Missouri have the honor to submit the following report of the progress, condition and wants of the institution for the year ending June, 1893.

Separate reports of the various departments of the University exhibiting the course of study prescribed in each, and the number and names of officers and students, the amounts of receipts and expenditures for the year ending December 31, 1892, together with much other useful information, will be found in their proper order in the following pages of this report. For convenience, the following facts are here condensed :

Total number of students enrolled during the year at Columbia	600
Total number of professors employed during the year at Columbia	25
Total number of assistants employed during the year at Columbia	21
Receipts for the year ending December 31, 1892 (including building fund)	\$335,365 41
Disbursements for the year ending December 31, 1892 (including building fund) \$329,717 31	
Total number of students enrolled during the year at Rolla	114
Total number of professors employed during the year at Rolla	4
Total number of assistants employed during the year at Rolla	4

Act of March 24, 1892.

By the legislative act of March 24, 1892, the Thirty-sixth General Assembly appropriated in terms \$237,500 "for the purpose of constructing, equipping and furnishing buildings and library for the accommodation and use of the State University." This appropriation is stated in the said act to consist of \$40,000 transferred from the Insurance Department fund to the "building fund;" \$50,000 contributed by the people of Columbia and Boone county, and \$147,500 derived from insurance on main building and contents destroyed by fire January 9, 1892. In the settlement of the claim for insurance, however, the company were allowed \$923 salvage on a part of the scientific outfit. Thus the insurance actually collected was only \$146,577, and the appropriation actually available is \$236,577 instead of \$237,500. It is important that notice be taken of this.

Law Library.

The greater part of the Law library was saved from the fire. The damage to it has been repaired by the purchase of the lost volumes, and it is now completely restored and in quite as good condition as formerly. The restoration has cost \$1234.38, taken out of the building fund.

General Library.

The General library was a total loss, except a few books that were out of the building at the time of the fire. Many books have since been donated by generous and sympathetic friends. These amount to about 1600 volumes.

The Board appropriated out of the building fund \$10,000 for the purchase of new books. These have all been bought and delivered. These books, though not so numerous as the books of the old library, are believed to be more valuable, having been carefully and judiciously selected by the combined wisdom and practical judgment of the entire Faculty. The present collection is but a good beginning of a library. Nothing is more useful to attract students and make them contented than the opportunity for a wide and varied course of reading. The University library ought in the next ten years to contain 50,000 volumes.

Scientific Instruments

The insurance derived from policies on scientific instruments amounted to \$447. This amount from the building fund has been reinvested in similar material. The Board of Curators also set apart a further sum from the building fund, to be invested in scientific aids and apparatus.

The modern sciences cannot be efficiently taught without proper equipment. The sciences are not only intellectual and theoretic; they are likewise material and practical. They deal with facts as well as ideas. Their conceptions are evolved in the exercise of delicate and dangerous powers, intimately connected with the business, commerce, travel, construction, manufacture, production, health, happiness and progress of the world. The student of the sciences goes directly from the class-room and laboratory to the application of his thoughts to the material wants and vast and complicated industries of mankind. He is trusted on his diploma, without question, as qualified practically for his profession. It is little less than a crime for the State to give him this reputation by its indorsement, without the full means for preparation to sustain it.

Conditions of Appropriation for Rebuilding.

The sum of \$236,577 appropriated by the act of March 24, 1892, was made available for the erection of the new University buildings upon two conditions, viz.: That the people of Columbia or Boone county should pay to the Curators of the University the sum of \$50,000, and that the town of Columbia should give to and file with the Board of Curators a bond, in the sum of \$50,000, conditioned that said town of Columbia would furnish for the use of the University, and for fire protection, water in the manner and to the extent mentioned in said act. The said sum of \$50,000 was so paid to the Curators, and by them paid to the State Treasurer. The said bond was duly executed and approved.

Since that time the town of Columbia has organized under the general law as a city of the third class, and has granted a franchise to W. T. Anderson and entered into a contract with him for the construction of a system of water-works, ample for all the purposes of Columbia. Operations have begun, and it is understood that the works will be completed during the summer of 1893.

Preparation for Building.

After the foregoing conditions were performed, the Curators proceeded, as rapidly as possible, to prepare for the erection of the new buildings. Their first duty was to employ an architect and superintendent. Mr. M. F. Bell, of Fulton, Mo., a gentleman highly accomplished in his profession, and possessing great practical skill in the management of such business, was selected, and has faithfully discharged his duties to the entire satisfaction of the Board of Curators. The character of the buildings, when completed, both in their internal construction and adaptation to their special purposes, as well as for the pleasing effect of the architectural designs, is relied upon as a justification of his selection. His estimate of the probable cost of the buildings has given almost accurate information to the Board, so as to guide them in their plans for the general improvement and equipment. His supervision of the work as it has progressed has been careful and unremitting.

Kind of Buildings.

Two courses of action seemed from the beginning open to the Curators, viz.: to erect a main building, or to erect a number of department buildings. On consideration it was ascertained that the amount appropriated was insufficient for the erection and equipment of a main building with any fire-proof qualities, and further, that greater accommodations could be secured, and more pressing wants met for the present, by several structures than by one; therefore, after mature consideration, it was determined to erect a system of department buildings.

In devising the system, the whole subject and all the conditions were thoroughly canvassed, and future buildings and improvements considered, so that convenience and economy might be secured and harmony of design attained now and hereafter. The number and capacity of the present buildings of course would be limited by the provisions of the act, which required that no building or buildings should be begun which could not be finished within the appropriation. It was found possible under this limitation to erect six buildings, viz.: a boiler and engine house for heating and power, a Manual Training building, a Physics and Engineering building, a building for Biology and Geology combined with a Museum, a Chemical Laboratory and a Law building. A comprehensive campus plan was surveyed and adopted upon the idea of a quadrangle or elongated court, 300 feet wide from east to west and extending from north to south. The new buildings are arranged on each side of the quadrangle, the Agricultural college building being one of the group. Future like buildings can be in harmony with these. The magnificent and imposing columns of the old building stand in the center of the court, and will be left standing—a sacred ruin and sad memorial to the lives of the old students, a monument of progress to the new.

As soon as possible after these preliminaries had been arranged, the architect prepared plans for the three first-named buildings; bids were advertised for and opened on June 21, 1892, and the contract for their erection awarded to Fred. H. Binder, of Jefferson City, for the sum of

\$69,085. Plans for the remaining three buildings being prepared, bids were advertised for and opened on July 21, 1892, and the contract for their erection awarded to Theo. Lacaff, of Nevada, Mo., for the sum of \$102,700.

Approval of Plans.

All said plans, specifications and detail drawings and contracts were duly approved by the Executive Board, and by the Governor, Secretary of State and State Auditor. In like manner, all plans, specifications and detail drawings and contracts for any work or material (not being equipment), to be paid for out of the building fund, have been duly approved.

Law Building.

The Law building is $68\frac{1}{2} \times 114\frac{1}{2}$ feet, and contains two very high stories and a basement. It has 12 rooms and offices, two large lecture rooms and a capacious library room. It was finished and ready for occupancy by the 1st of February. On the west front is a tower 88 feet high. The contract price is \$31,000.

Chemical Building.

The Chemical building has a front on the quadrangle of 132 feet, and is 90 feet deep. It will have two stories and a full basement. It is ready for the roof, is to be completed by August 15, 1893, and the contract price is \$28,000. This building is so planned as to meet every convenience and the highest scientific requirements of the most modern chemical instruction, investigation and experiment. There is nothing in the West that will exceed it in useful arrangements and appointments.

Biology and Geology with Museum.

This building will have a frontage of 140 feet by a depth of 100 feet. It will contain two stories and a basement. The central portion is the Museum, 46×100 in first and second stories, entirely fire-proof, with floors of tile. The wings to the right and left of the Museum are for the departments of Geology on the one side and for Biology on the other. Each of these wings will have eight rooms, in addition to a large lecture hall. The contract price for this building is \$43,700. It is to be finished September 15, 1893.

Physics and Engineering Building.

The Physics and Engineering building has a frontage of 145 by a depth of 78 feet. It will have two stories and a full basement, with a tower at the center of the front 92 feet high. It will be arranged for Physics and Civil, Mechanical and Electrical Engineering. It will contain 32 rooms, in addition to the two lecture halls, 23×40 feet. The contract price is \$30,000. This building is completed.

Manual Training Building.

The Manual Training building has a frontage of 108 feet by a depth of 117 feet. It consists of two stories and a full basement. It has six shop-rooms 40×40 feet; an exhibit hall 25×40 feet; two offices 16×18 feet; one drawing-room 40×40 feet; two class-rooms 18×22 feet, besides store-room, engine-room, lavatories, etc. The driving power of the

machinery is a 90-horse power Corliss engine. The contract price of the building is \$27,000. This building has been completed and occupied since February. When in full operation it will accommodate 400 students by classes, 24 in a class, and two hours to a class each day.

Power House.

The power house is 72×86 feet, one story (21 feet) high. At the south end is the enormous brick smoke-stack, 100 feet high, with solid stone foundation 13 feet in the ground. It has room for a coal supply for two months. It has a commodious work-shop and store-room. It cost \$12,305, and is finished. It contains a plant of four boilers, all new, aggregating 400 horse power. One of these is designed to furnish steam power to the engine at Manual Training building, and the other three steam for heating all the buildings. Sunk to a depth of ten feet is a basement room for receiving tank and pump. Out of this basement room goes

The Tunnel.

The tunnel is built of hard brick laid in cement, with brick floor, overlaid with cement. It is 6 feet 6 inches in the clear in height, and 4 feet wide inside measure. Iron stays are fixed on the sides at intervals to support the steam and return pipes. The tunnel at points is 21 feet under ground. Its whole length, including turnouts, is 1418 feet. Its total cost was \$11,742.18. It extends from the power house diagonally into the quadrangle, where it forks. One branch goes due north on a line twelve feet from the line of the buildings to the Agricultural College building. The other branch goes due east to the Museum building, then turns due north to the Law building. Opposite each building is a turnout for the inlet of steam pipes. The steam pipes extend from the boilers throughout the length of the tunnel, as do also the return pipes. There is a gradual fall from the extremes back to the power house, so that all condensation returns by gravity into the receiving tank and is pumped again into the boilers. Thus all the buildings are to be heated from one boiler plant. The convenience of the system is admirable, and the saving in fuel and service will soon pay for the whole outlay. One engineer and one fireman can ordinarily do the entire work. The tunnel is equally convenient to the position for the main building, and can be extended to any other buildings that may in future be erected upon the campus or adjacent to it.

Sewers.

A complete sewer system has also been planned for the whole system of buildings for the present and future. It is comprehensive enough to cover all cases, and can be indefinitely extended over the campus. The present extension being put in is for all the new buildings and the main building, and will cost \$2465, the contract price.

Gas-fitting and Plumbing.

The gas-fitting and plumbing in the Manual Training and Law buildings have been completed. Similar work in the Physics and Engineering and Chemical buildings is now in progress. It is intended that all this material and work shall be of the best quality.

Academic Hall.

The 37th General Assembly appropriated \$250,000 for the construction of a main building, and for furnishing the same with heat, light and water. At a meeting of the Board of Curators held in May, a general plan was adopted, and it was decided to call this building the "Academic Hall." It will have an extreme length east and west of 319 feet. The depth of the building from north to south varies from 60 to 130 feet. The whole building will have three full stories and a high basement, which may be counted as practically a fourth-story. The tip of the dome is 180 feet above the level of the ground. The east end will contain the chapel. This will be an exact copy of the old chapel, which was one of the handsomest in America, and will seat comfortably 1500 people. The west end will be given up to the Library and to suites of rooms for the young women. The central portion of the building—85 by 130 feet—will be devoted to lecture-rooms and offices. An effort will be made to have the chapel ready by the first of June, 1894.

New Departments.

The rapid expansion of the University has caused the establishment of the following new departments: (1) Mechanical Engineering. (2) Electrical Engineering. (3) Philosophy.

Professor C. W. Marx, Superintendent of Department of Mechanic Arts, was elected to the chair of Mechanical Engineering, and Professor Wm. Shrader was chosen to the chair of Electrical Engineering. The chair of Philosophy has not yet been filled.

The University in State Economy.

There are four essential elements of University success and usefulness, viz.: Faculty, buildings, equipment and students. Of these, the corps of instruction is first in order and force. High character, strong intellect, comprehensive, accurate learning, practical wisdom, correctness of purpose and sincere love of their work are the qualities demanded. The selection of the professors must depend upon the good judgment of the managing authority, with the means placed at their disposal. In selecting a Faculty, it has been the aim of the Curators to make such a reputation for the University that a professorship in any of its departments shall be not only a guaranty of intellectual force and scholarship, but, what is of far greater moment, evidence of moral worth and irreproachable character. Should any fail in this regard, it would be a cause for displacement without hesitancy. Our present Faculty we believe worthy the utmost confidence. They are presided over by a President of the most eminent moral qualities and irrepressible intellectual force; a man of noble character, high sentiment, broad views of life and destiny, and under all conditions guided by the greatest of all purely mental endowments, good common sense. The Faculty are able, learned and laborious. Amid the wreck and waste of the fire, in rented rooms and with depleted accommodations, they, by their combined effort and great excellence of work, have kept the University intact and held its student

corps to a higher number than when the great main building stood with all its comforts, conveniences, equipment and libraries.

Facts are better than words. No commendation could add to the testimony of these results. They fully justify the State for the outlay it has made or may make in supporting their endeavors by providing amply all needed facilities. To supply buildings and equipment is the office of the State, and this duty will be discharged according to its ability and its appreciation of higher education. Students in any number will not be wanting, where the conditions are equal to the necessities of modern education. There is no investment which a State can make equal to a great University. There is no advantage to a people so noble in itself, so grandly enduring in results, so far-reaching and irresistible in influence. It is at once a monument to constitutional vigor and character, and a mighty controlling power. A University is the laboratory of the highest thought, the training school of genius. It gathers together and utilizes the mind-power of a people, conferring upon it the strength of trained exercise, the momentum of a compact moving body, the readiness of practiced and accurate drill, the armor of broad and liberal learning.

The most real wealth of a State is cultivated intellect, neither diminished by use, damaged by fire nor wasted by flood. The University supplies to the State an accumulation of mental equipment and reserved power ready for any emergency of statesmanship, war or scientific application; and this necessity for provident preparation is constantly growing. The State which neglects it must eventually yield to that which supplies it. True, here and there some great minds have and will continue to develop without special training; but these are exceptions, and even in these isolated cases it will be found that such minds are the production of the institutions under which they live. Taking no notice of the forces in society that have strongly impressed and characterized them, the world calls them self-made; but they are the genuine offspring of their time. The prepotency of racial features and political, moral and intellectual conditions and natural environment are too often in these cases overlooked.

The influences of universities are not alone direct upon their students, but also strongly indirect upon the people. They exercise a potent secondary influence almost boundless in its beneficence. Through the popular lore of the land, they mingle the strength, precision and ambition of a higher education. They thus uphold the purpose of the people, and stimulate them to more thorough mental preparation in reading, study and attention to greater problems in government, business and scientific methods.

The sciences are now everywhere regarded as the friends of the most common and practical concerns of every-day life. They are no longer confined to the laboratory as curiosities of the few, but have gone out to the shop, the field and the factory. The University is the demonstrator and teacher of their uses; the people are the recipients of their benefits. The light which the University spreads is diffused for all. It reaches with gentle touch every shady place in life.

Universities are the steadfast friends of the public schools. Thomas Jefferson created the University of Virginia; he also was the author of the school system of Virginia. The interest of the University and the public school is one. They are complements the one of the other. They cannot be divorced without immediate and permanent injury to both. In our admirable constitution they together constitute the public school system. Both are made subject to the same State control and entitled to the same conscientious care and adequate support. The University and the public school in Missouri are of the same blood. They differ only in their offices. The University is not an interest separate from the popular interest. Its teachings are not contrary to the truths taught in the public schools. All truth is of one essence and agrees with itself. The public schools deal with facts and elements, the University with the reason and principle of things, and scientific investigation and experiment, whereby the bounds of human knowledge are enlarged for all, finding its speedy way into the smallest concerns of practical life. This is now the best thought of the civilized world. In Germany her great universities at Berlin, Leipsic, Goettingen and Strassburg are not more distinguished for higher learning than are her minor schools for efficiency and usefulness among the people. And who for a moment would assert that Cambridge and Oxford had been detrimental to the commons in England—two forces that more than any others have supported the English dominion by endowing the English mind? For these two universities it is claimed that “they carried the English flag around the world.”

With equal pride all Americans regard Yale, Harvard, Dartmouth, Bowdoin or Princeton. And shall not Missourians love and cherish their University, now rapidly growing in power and usefulness? Certainly Missourians cannot be so short-sighted as not to do all they can for so grand an interest.

Their public school system is unsurpassed on the continent. They will make their University correspondingly great and successful. In every age great scholars, profound thinkers, overmastering intellects, wonderfully accurate scientists and ingenious inventors are a necessity, but especially so in this age of surprise, newness and mighty progress. The energies with which the world once wasted itself in war are now turned to intellectual dominion and the triumphs of learning. It is not the mighty tread of nations sounding along the highway that leads to conquest now, but the silent hosts of thought and the viewless march of mind. The camp of civilization is pitched in the lecture-room and in the laboratory. The standard of the university is set up where once the eagles of the legion stood.

The thoughts of great minds come to the world like the benedictions of Providence. One thought of Galileo restored to human knowledge the round world and made the discovery of America possible. The announcement by Newton of the law of gravitation gave to mankind the key of material progress as well as astronomical discovery and revelation. The inductive system of philosophy by Bacon freed the human soul from the insufferable tyranny of cant and dogma, opening to it the avenues of

true science and true methods of scientific investigation, by leading through factual knowledge to a generalization that might disclose the secret principle and basis of things. The declaration by Thomas Jefferson "that all men are created equal" became instantly the announcement of liberty to all mankind.

A single thought has often created within an hour untold wealth, where toil and industry failed or were at a great disadvantage. Eli Whitney, by a simple application of reason to material, enabled the American people to accumulate wealth at the rate of more than ten millions of dollars a day. Samuel Howe, by reversing the needle and putting the eye at the point, freed the women of the world from industrial slavery, and made the "Song of the Shirt" the mere dream of poesy. The invention of the reaper and harvester by McCormick, and other field labor-saving machinery by others, has increased the agricultural production of America a thousand fold, and brought a comfort to toil incalculable in money and unlimited in time. There is a wealth of soil, but a greater wealth of mind—an evanescent glory of "circumstance," but an enduring glory of intellect—that lives on to heighten the fame and brighten the deeds of a people even when they have passed away. Missouri lies well in climate and position. Her rivers are broad and her fields are fertile. But she will not be remembered for these. Such she was before we came to possess her advantages. Her fame and character must rest upon the achievements of her citizens. It is not nature lives in history, but man. It is not wealth of soil that endures, but riches of heart and brain.

The University stands a mere point by the mountain height, but the sun shines not half so bright on the one as glory sheds its luster upon the other. One single great man developed in the University were cheap at a million dollars and twenty years of time. We pay the highest tribute to the noblest souls, and every age has felt and owned the mystic power of the matchless intellect that towered above its times and cast its influence above and beyond them far out to the future. When Macedon's tyrant lived, the people of the Peninsula met to ask: "What is Philip doing?" And to-day all England awakes to inquire concerning the health and latest thought of Gladstone. Mind is empire. At last, mind rules the world and holds in its grasp the everlasting fame and destiny of nations. Missouri has a noble people. She is settled by an intellectual race, marked by high ambition and enduring purpose. Her citizens possess in a singular degree energy, enterprise and a free and noble spirit. They are brave, chivalrous, faithful and true. Not to afford to such a people the means of the highest intellectual development possible is little less than a crime. It is an irreparable injury to the present and a blight upon the future. The youth of Missouri have a claim upon their State for the advantages of a University equal in all its appointments to the best in the country.

Respectfully submitted.

G. F. ROTHWELL,
President of the Board of Curators.

CORPORATION.

THE BOARD OF CURATORS.

HON. B. M. DILLEY	Hamilton	} Term expires Jan. 1, 1895.
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HON. J. R. RIPPEY	Glenwood	} Term expires Jan. 1, 1897.
HON. G. F. ROTHWELL	Moberly	
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HON. B. M. DILLEY	Vice-President
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Secretary.	Treasurer (office at Rolla).

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HON. G. B. ROLLINS	Columbia

*Deceased.

FACULTY OF THE UNIVERSITY.

(Excepting those of the President and the Chairman of the Faculty, the names are printed in the order of appointment.)

RICHARD HENRY JESSE, LL. D.,
President.

JAMES SHANNON BLACKWELL, M. A., Ph. D.,
Chairman of the Faculty.

JOSEPH G. NORWOOD, M. D., LL. D.,
Emeritus Professor of Physics.

PAUL SCHWEITZER, Ph. D.,
Professor of Chemistry.

ANDREW WALKER McALESTER, A. M., M. D.,
Professor of Surgery and Diseases of Women and Children.

WOODSON MOSS, M. D.,
Professor of Anatomy and Practice of Medicine, Secretary of the Medical Faculty.

JAMES SHANNON BLACKWELL, M. A., Ph. D.,
Professor of Semitic and Modern Languages.

WILLOUGHBY CORDELL TINDALL, M. S.,
Associate Professor of Mathematics.

JOHN CARLETON JONES, A. M., Ph. D.,
Professor of Latin Language and Literature.

EDWARD ARCHIBALD ALLEN, Litt. D.,
Professor of English Language and Literature.

WILLIAM BENJAMIN SMITH, A. M., Ph. D.,
Professor of Mathematics and Astronomy.

†WILLIAM WALLACE CLENDENIN, S. M., A. M.,
Assistant Professor of Geology and Mineralogy.

†HENRY CAPLES PENN, A. B.,
Assistant Professor of English Language and Literature.

GEORGE DANA PURINTON, A. M., M. D., Ph. D.,
Professor of Biology and Curator of the Museum.

GARLAND CARR BROADHEAD, M. S.,
Professor of Geology and Mineralogy.

JAMES AULL YANTIS, LL. B.,
Resident Professor of Law.

†Absent for the session of 1892-93.

†BENJAMIN FRANKLIN HOFFMAN, L. M.,

Assistant Professor of Modern Languages.

MILLARD LEWIS LIPSCOMB, A. M.,

Professor of Physics.

*WALTER B. RICHARDS, M. A.,

Professor of Mathematics.

EDWARD D. PORTER, M. A., Ph. D.,

*Professor of Agriculture, Dean of the College of Agriculture and Mechanic Arts, and
Director of the Experiment Station.*

*AUSTIN LEE McRAE, Sc. D.,

Professor of Physics.

ALEXANDER MARTIN, A. M., LL. D.,

Professor of Law and Dean of the Law Faculty.

WILLIAM GWATHMEY MANLY, M. A.,

Professor of Greek Language and Literature.

MILTON UPDEGRAFF, M. S., B. C. E.,

Assistant Professor of Mathematics and Astronomy, and Director of the Observatory.

JOSEPH PHILIP BLANTON, A. M.,

Professor of Theory and Practice of Teaching.

JOHN MILLER BURNAM, A. M., Ph. D.,

Assistant Professor of Latin Language and Literature.

GEORGE ARMSTRONG WAUCHOPE, M. A., Ph. D.,

Assistant Professor of English Language and Literature.

CHRISTIAN WILLIAM MARX, B. E.,

Professor of Mechanical Engineering and Superintendent of Mechanic Arts.

JOHN WALDO CONNAWAY, M. D. C., M. D.,

Professor of Physiology (Human and Comparative).

WILLIAM SHRADER, B. S., Ph. D.,

Professor of Electrical Engineering and Assistant Professor of Physics.

*ELMO G. HARRIS, C. E.,

Director of School of Mines and Professor of Engineering.

FREDERICK HOMBURG, B. S.,

Assistant Professor of Chemistry.

JOHN DAVIDSON LAWSON, B. C. L., LL. D.,

Professor of Law.

‡PAUL EVANS, M. D.,

Professor of Histology and Bacteriology.

CHARLES ALBERT KEFFER, M. H.,

Professor of Horticulture.

‡ALEXANDER MAITLAND, C. E.,

Assistant Professor of Engineering.

*School of Mines and Metallurgy at Rolla.

† Absent for the session of 1892-93. ‡ Resigned.

FREDERICK CHARLES HICKS, Ph. D.,
Professor of History and Political Economy.

JOHN PICKARD, A. M., Ph. D.,
Associate Professor of Greek and Archaeology.

LEO WIENER,
Assistant Professor of Modern Languages.

EDWIN WINFIELD BOWEN, A. M., Ph. D.,
Assistant Professor of English Language and Literature.

RICHARD HADEN HOOD, C. E.,
Professor of Civil Engineering.

SAMUEL A. SMOKE (Lieutenant U. S. Army),
Professor of Military Science and Tactics.

*WILLIAM H. SEAMON, B. A. S.,
Professor of Chemistry and Metallurgy.

Professor of Philosophy (to be appointed soon).

Professor of Art.

Professor of Elocution.

*PAUL J. WILKINS, B. S.,
Instructor in Academic Department.

†SILAS DINSMOOR,
Assistant in Chemistry.

WILLIAM RUFUS DODSON, S. B.,
Assistant in Biology.

JOSEPH FRANCIS PAXTON, A. B.,
Assistant in Latin.

*THOMAS LEWIS RUBEY, A. M.,
Instructor in Academic Department.

*DANIEL C. JACKLING, B. S.,
Assistant in Chemistry and Metallurgy.

CHARLES BEMIS REARICK,
Assistant in Drawing and Mechanic Arts.

MELVILLE SINCLAIR KING, M. Acc'ts,
Instructor in Commercial School.

WILLIAM RICHARD GENTRY, L. B.,
Assistant in Modern Languages.

GEORGE LINCOLN BROWN, S. B.,
Tutor in Mathematics.

JEAN AUGUSTA SHAEFER,
Tutor in Mathematics.

*School of Mines and Metallurgy at Rolla

† Absent for the session of 1892-1893.

MARQUIS HARTWELL LOCKWOOD,
Tutor in Mineralogy and Physics.

CLIFFORD LEROY HARE, B. S.,
Assistant in Chemistry.

NORMAN COLMAN RIGGS,
Tutor in Mathematics.

FRANK BLAIR WILLIAMS, S. B.,
Tutor in Mathematics.

HOWELL VAN BLARCOM,
Assistant in Mechanic Arts.

ISIDOR LOEB, S. B.,
Tutor in History.

*CLIFFORD B. SPENCER,
Assistant in Engineering and Mathematics.

*THOMAS GRAYSON POATS,
Instructor in Shop-work and Mechanical Drawing.

SUMMARY.

Professors	29
Associate Professors	2
Assistant Professors	10
Assistants	9
Instructors	4
Tutors	6
Total	60

OTHER OFFICERS.

Mrs. KATE HENDRICKS,
Matron

J. G. BABB,
Proctor of the University.

Miss KATHERINE P. IGLEHART,
Secretary of the University

JOHN WATSON MONSER,
Librarian.

*THOMAS LEWIS RUBEY, A. M.,
Secretary of the Faculty.

JOSEPH FRANCIS PAXTON, A. B.,
Secretary of the Faculty.

Gen. J. B. DOUGLASS,
Superintendent of Unsold College Lands.

*W. M. SMITH, *Proctor.*

*MRS. T. L. RUBEY, *Librarian.*
For officers of Experiment Station, see p. 39.

*School of Mines and Metallurgy at Rolla.

DEPARTMENTS OF THE UNIVERSITY.

I. ACADEMIC.

A. LANGUAGE.

- I—English.
- II—Latin.
- III—Greek.
- IV—Modern.
- V—Semitic.
- VI—Sanskrit.
- VII—Comparative Philology.

B. SCIENCE.

- VIII—Political Science.
- IX—Philosophy.
- X—Mathematics and Astronomy.
- XI—Physics.
- XII—Chemistry.
- XIII—Geology and Mineralogy.
- XIV—Biology.

II. PROFESSIONAL.

- XV—1. Agriculture and Mechanic Arts.
- XVI—2. Normal Instruction.
- XVII—3. Law.
- XVIII—4. Medicine.
- XIX—5. Engineering (Civil, Mechanical and Electrical).
- XX—6. Military Science and Tactics.
- XXI—7. Art.
- XXII—8. Elocution.
- XXIII—9. Mining and Metallurgy.

ACADEMIC DEPARTMENTS.

ACADEMIC FACULTY.

(Excepting those of the President and the Chairman of the Faculty, the names are printed in the order of appointment.)

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Chairman of Faculty.

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JAMES SHANNON BLACKWELL, M. A., Ph. D.,
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† BENJAMIN FRANKLIN HOFFMAN, L. M.,
Assistant Professor of Modern Languages.

† Absent for the session of 1892-93.

- MILLARD LEWIS LIPSCOMB, A. M.,
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- WILLIAM GWATHMEY MANLY, M. A.,
Professor of Greek Language and Literature.
- MILTON UPDEGRAFF, M. S., B. C. E.,
Assistant Professor of Mathematics and Astronomy, and Director of the Observatory.
- JOSEPH PHILIP BLANTON, A. M.,
Professor of Mental and Moral Philosophy.
- JOHN MILLER BURNAM, A. M., Ph. D.,
Assistant Professor of Latin Language and Literature.
- GEORGE ARMSTRONG WAUCHOPE, M. A., Ph. D.,
Assistant Professor of English Language and Literature.
- JOHN WALDO CONNAWAY, M. C. D., M. D.,
Professor of Physiology.
- WILLIAM SHRADER, B. S., Ph. D.,
Assistant Professor of Physics.
- FREDERICK HOMBURG, B. S.,
Assistant Professor of Chemistry.
- FREDERICK CHARLES HICKS, Ph. D.,
Professor of History and Political Economy.
- JOHN PICKARD, A. M., Ph. D.,
Associate Professor of Greek and Archæology.
- LEO WIENER,
Assistant Professor of Modern Languages.
- EDWIN WINFIELD BOWEN, Ph. D.,
Assistant Professor of English Language and Literature.
- †SILAS DINSMOOR,
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- WILLIAM RUFUS DODSON, S. B.,
Assistant in Biology.
- JOSEPH FRANCIS PAXTON, A. B.,
Assistant in Latin.
- MARQUIS HARTWELL LOCKWOOD,
Tutor in Mineralogy and Geology.
- WILLIAM RICHARD GENTRY, L. B.,
Assistant in Modern Languages.
- GEORGE LINCOLN BROWN, S. B.,
Tutor in Mathematics.
- JEAN AUGUSTA SHAEFER,
Tutor in Mathematics.
- CLIFFORD LEROY HARE, B. S.,
Assistant in Chemistry.
- NORMAN COLMAN RIGGS,
Tutor in Mathematics.
- FRANK BLAIR WILLIAMS, S. B.,
Tutor in Mathematics.
- ISIDOR LOEB, S. B.,
Tutor in History.

†Absent for the session of 1892-93.

I. Department of English.

EDWARD A. ALLEN, Professor. { H. C. PENN,
 { G. A. WAUCHOPE, } Assistant Professors.
 { E. W. BOWEN,

The following courses are offered:

1 and 2. The principles of written discourse. Exercises and themes. Four sections, two semesters, two hours a week, Wednesday, Friday (Freshman). Professors WAUCHOPE and BOWEN.

Clark's Rhetoric; Lectures.

3 and 4. The History of English Literature, (1) from its beginnings to the Restoration, (2) from the Restoration to the Present; and the study of masterpieces of representative authors from Chaucer to Tennyson. Parallel readings. Essays on literary and historical subjects. Two semesters, three hours a week, Tuesday, Thursday, Saturday (Sophomore). Professor ALLEN.

Lectures; Nicoll's Landmarks of English Literature; English Classics.

Useful for reference: Stopford Brooke's English Literature; Greene's Short History of the English People; Minto's Manual of English Prose; Ward's English Poets; Saintsbury's Elizabethan Literature; Gosse's Literature of the Eighteenth Century; Stedman's Victorian Poets. These books are recommended for purchase.

5. History of the English Language. Theses. *First semester*, three hours a week, Tuesday, Thursday, Saturday (Junior). Professor ALLEN.

Lectures: Lounsbury's History of the English Language; Sweet's Anglo-Saxon primer.

6. Study of modern Prose style, based upon the masterpieces of best authors. Essays. *Second semester*, three times a week, Tuesday, Thursday, Saturday (Junior). Professor ALLEN.

Genung's Rhetorical Analysis; Prose Authors.

Required for L. B., courses 1, 2, 3, 4, 5 and 6; for S. B., courses 1, 2, 3, 4 and 5; for A. B., courses 1, 2, 3 and 4.

ELECTIVE COURSES.

7 and 8. Anglo-Saxon Prose and Poetry. *First and second semesters*, two hours a week, Wednesday, Friday (Senior). Professor ALLEN.

Sweet's Anglo-Saxon Reader; Earle's History of Anglo-Saxon Literature.

9. Middle English. *Second semester*, two hours a week, Wednesday, Friday (Senior). Professor ALLEN.

Morris and Skeat's Specimens of Early English, Part II.

10. Anglo-Saxon Grammar (Comparative). *Second semester*, two hours a week, Tuesday, Saturday (Senior). Professor BOWEN.

11. Gothic. *Second semester*, two hours a week (Senior). Professor WAUCHOPE. Wright's Gothic Primer. For reference: Braune and Bagg.

12. Anglo-French. *First semester*, two hours a week. Knowledge of Latin and French necessary. Professor ALLEN.

13. Chaucer. *First semester*, two hours a week. Professor ALLEN.

14. Shakspeare. *First semester*, two hours a week. Professor BOWEN.

† Absent for the session of 1892-93.

15. The Elizabethan Drama. *First semester*, two hours a week. Professor WAUCHOPE.

Thayer's Best Elizabethan Plays.

16. Principles of English Versification. One hour a week.

17. Course 5 (Lectures on the English Language) is open, as a Junior elective, in the A. B. course. *First semester*.

18. Course 6 (Modern Prose) is open, as a Junior elective, in the A. B. and S. B. courses. *Second semester*.

A graduate course is provided for students desiring to carry on further their studies in English. The following will indicate in a general way the work done: Beowulf (Harrison and Sharp); Cynewulf (Kent); Cook's-Siever's A. S. Grammar; Ten Brink's Literature; Skeat's Principles of English Etymology.

A special medal, known as the "McAnally medal," is offered for the best essay, thesis or poem by members of the Senior class competing under certain rules laid down by founder of the prize. Subject for 1893-94: James Russell Lowell.

Enrollment of students in the English department, 1892-93: Collegiate (required and elective), 246; Preparatory, 198.

II. Department of Latin Language and Literature.

J. C. JONES, Professor; J. M. BURNAM, Assistant Professor; J. F. PAXTON, Assistant.

The subjects taught in this department are the Latin Language and Literature, the Geography, Mythology, Antiquities and History of the Romans.

1. Sallust. *First semester*, daily at 9 (Freshman).

Text-books: Herbermann's Sallust, Allen and Greenough's Grammar, Allen's Prose Composition, Allen's History of Rome.

2. Cicero (Orations). *Second semester*, daily at 9 (Freshman).

Text-books: Kelsey's Cicero, Allen and Greenough's Grammar, Allen's History of Rome.

The aim of the above courses is to give the student facility in reading Latin prose. Daily practice in sight-reading will be given during this year.

3. Virgil. *First semester*, daily at 12 (Sophomore).

Text-books: Greenough's Virgil, Allen and Greenough's Grammar, Prose Composition.

Lectures on Mythology will be given by the instructor.

4. Horace. *Second semester*, daily at 12 (Sophomore).

Text-books: Wickam's Horace, Kirkland's Horace, Allen and Greenough's Grammar, Prose Composition.

Lectures on Roman Literature will be given by the instructor.

5. Livy or Tacitus. *First semester*, Tuesday, Thursday, Saturday at 10 (Junior).

Text-books: Lord's Livy, Hopkins' Tacitus, Allen and Greenough's Grammar, Tighe's Roman Constitution. This course involves minute study of syntax and some attention to Latin philology.

All of the above courses are required of candidates for the A. B. degree, and all except 5 of candidates for L. B. degree.

ELECTIVE COURSES.

- 6 Cicero. Two hours a week, *first semester*. Professor JONES.
7. Terence. Three hours a week, *second semester*. Professor JONES.
8. Plautus. Three hours a week, *first semester*. Professor JONES.
9. Syntax. A study of the Cases, Moods and Tenses. Remnants of Early Latin. Two hours a week, *second semester*. Professor JONES.
10. Rapid reading of Latin prose. Two hours a week, *first semester*. Professor BURNAM.
11. Rapid reading of Latin poetry. Three hours a week, *second semester*. Professor BURNAM.
12. Lectures on Roman Constitutional Law. Three hours a week, *first semester*. Professor BURNAM.
13. Lectures on Roman Constitutional Law. Three hours a week, *second semester*. Professor BURNAM.

14. Roman Private Law. Two hours a week, *second semester*. Professor BURNAM.

15. Teachers' Course. This is intended for students who plan to engage in teaching. It is offered both semesters once a week. Hours of all elective courses to be arranged with the instructor.

Courses 6, 7, 8 and 9 are designed for such students as desire to study the historical development of Latin; Courses 10, 11, 12, 13 and 14 are designed for those who desire to study the literature and antiquities.

PREPARATORY COURSE.

[The first year of this course will be discontinued after the session of 1892-93, and the second year after the session of 1893-94.]

This course is intended for those students who are not prepared for the Freshman year (Course I), and extends over two years.

First Year—Collar & Daniell's Beginner's Latin Book completed.

Second Year—Caesar (De Bello Gallico), books II, III, IV, V, I.

Text-books: Kelsey's Caesar, Allen's Prose Composition, Allen and Greenough's Grammar, Ginn's Classical Atlas.

The Roman pronunciation is used, and its adoption is urged upon all teachers preparing students for the University.

A prize is offered for competition in the Sophomore and Junior classes. It will be awarded in 1892-93 to the student who makes the best translation into Latin of Chap. I, McCarthy's History of Our Own Times, through the words "his early promise." At the Commencement of 1892 this prize was awarded to Mr. J. E. Goodrich.

Enrollment of students in the Latin department: in required and elective courses 254.

III. Department of Greek Language and Literature.

WM. G. MANLY, Professor; JOHN PICKARD, Associate Professor.

COURSES.

1. Xenophon: *First semester*, Tuesday, Wednesday, Friday, Saturday, at 10. (Xenophon's Anabasis, Goodwin's Greek Grammar, Woodruff's Greek Prose Composition, Smith's History of Greece, Kiepert's or Ginn's Classical Atlas.)
 2. Herodotus: *Second semester*, Tuesday, Wednesday, Friday, Saturday, at 10. (Herodotus, Book VII, Seemann's Mythology, Goodwin's Greek Grammar, Woodruff's Greek Prose Composition.)
 3. Homer: *First semester*, daily at 9. (Merry's Odyssey XIII-XXIV, Autenrieth's Homeric Dictionary, Seymour's Homeric Language and Verse, Jebb's Introduction to Homer.)
 4. Plato: *Second semester*, daily at 9, and one extra hour. (Apology, Crito, Phædo, Goodwin's Greek Moods and Tenses, Jevon's Greek Literature.)
 5. Greek Tragedy: *First semester*, Tuesday, Thursday, Saturday, at 12. (Æschylus, Sophocles or Euripides.)
 6. Demosthenes: *Second semester*, Tuesday, Thursday, Saturday, at 12.
 7. Life of the Ancient Greeks: *Two semesters*. Tuesday, Thursday and Saturday at 11. Professor MANLY. Lectures illustrated by maps, charts and stereopticon views. No knowledge of the Greek language is necessary for this course.
 8. New Testament: *Two semesters*, two hours a week. Professor MANLY. Hours to be arranged with the instructor.
 9. Rapid Reading of Greek prose: *One semester*, two hours a week to count as one. Professor MANLY. Hours to be arranged with the instructor.
 10. Homer: Rapid Reading and study of Homeric Antiquities. *One semester*, two hours a week. Professor MANLY. Hours to be arranged with the instructor.
 11. Greek Theater: *First semester*, one hour a week. Professor PICKARD. Hours to be arranged with the instructor.
- Courses 1 and 2 (Freshman), 3 and 4 (Sophomore), 5 and 6 (Junior), are required for the A. B. degree; course 7 is required for the L. B. degree, and does not demand a knowledge of the Greek language.

PREPARATORY COURSE.

[This course will be discontinued after the session of 1893-94.]

This course is intended for students not prepared to enter the Freshman class. *Two semesters*, daily at 9. J. W. White's Beginner's Greek Book, Moss' First Greek Reader, Smith's History of Greece, Kiepert's or Ginn's Classical Atlas.

DEPARTMENT OF CLASSICAL ARCHÆOLOGY.

Associate-Professor PICKARD.

ELECTIVE COURSES.

1. History of Greek Art. *Two semesters, three hours a week.*
2. Greek Epigraphy. *Two semesters, one hour a week. Text-book.*
3. Archæological Seminary. *Two semesters, two hours a week.*
4. History of Greek Vases and Vase Painting. *First semester, one hour a week.*
5. Greek Ideals of the gods. *Second semester, one hour a week.*
6. History of Etruscan and Græco-Roman Art. *Second semester, two hours a week.*

The first semester of course 1 is a prerequisite to this course.

Students should consult the Professor before electing any of these courses.

Courses 1, 3, 4, 5 and 6 do not require a knowledge of the Greek language.

IV. Department of Modern Languages.

J. S. BLACKWELL, Professor. †B. F. HOFFMAN, Assistant Professor.

L. WIENER, Assistant Professor. W. R. GENTRY, Assistant.

Besides the study of grammar and composition, lectures on German and French literature, as outlined in the last catalogue, were given to classes in 1892-93. Classes in German read Boisen's Reader, Heine's Harzreise, Peter Schlemihl, Schiller's Maria Stuart, Gore's German Science Reader, Seidensticker's Scientific Series of Monographs, Buchheim's German Lyrics, Goethe's Egmont, Echtermayer's Auswahl deutscher Gedichte, and Goethe's Faust, first part. Classes in French read Whitney's Brief Reader, Colomba, Le Roman d'un Jeune Homme Pauvre, Balzac's Eugenie Grandet, Dumas's L'Evasion du Duc de Beaufort (from Vingt Ans Apres), Lamartine's Jeanne D'Arc, Victor Hugo's La Chute (from Les Miserables), and DeMussat's Fantasio. Classes in Spanish read in Knapp's Readings, and classes in Italian in Foresti's Reader.

REQUIRED COURSES.

1 and 2. Beginning German. Whitney's Brief Grammar and Short Reader, Blackwell's Manual, Andersen's Maerchen. Four sections. Thrice a week. Professors BLACKWELL, WIENER and GENTRY.

†Absent for the session of 1892-93.

1 and 2. Beginning French. Whitney's Brief Grammar and Brief Reader, Merimee's Colomba. Three sections. Thrice a week. Professors BLACKWELL, WIENER and GENTRY.

3. German Prose Composition, Maria Stuart, lectures. Thrice a week. Professor GENTRY.

3. French Composition and Syntax. Victor Hugo's Bug Jargal, Lamartine's Jeanne D'Arc, lectures. Thrice a week. Professor GENTRY.

4. German Composition continued. Peter Schlemihl, Heine's Harzreise, lectures. Thrice a week. Professor GENTRY.

4. French Composition continued. Georges Sand's La Mare au Diable, Victor Hugo's Ruy Blas, lectures. Thrice a week. Professor GENTRY.

ELECTIVE COURSES.

1 and 2. Beginning Spanish. Manning's Grammar, Knapp's Reading Lessons. Twice a week. Professor BLACKWELL or WIENER.

1 and 2. Beginning Italian. Grandgent's Grammar, Reader. Twice weekly. Professor BLACKWELL or WIENER.

1 and 2. Beginning Russian. Riola's How to Learn Russian, Riola's Reader. Twice a week. Professor BLACKWELL or WIENER.

3 and 4. In Spanish, Selections from Don Quixote and the Cancioneros, Studies in Calderon, Ticknor's Literature. Twice a week. Professor BLACKWELL or WIENER.

3 and 4. In Italian, Tasso's Girusalemme Liberata, four cantos, Machiavelli's Principe, History of the Literature. Twice weekly. Professor BLACKWELL or WIENER.

5. Goethe's Egmont, German Composition, Lectures on the Drama. Thrice a week. Professor WIENER.

5. French Composition, Balzac's Eugenie Grandet, Moliere's Le Bourgeois Gentilhomme, Lectures on the Drama. Twice a week. Professor BLACKWELL.

6, 7 and 8. In German, Dichtung und Wahrheit, Schiller's Ballads, Heine's Poems, Wenckebach's Literaturgeschichte, Goetz von Berlichingen, Faust, first part, Lessing's Laokoon, Nathan der Weise, Composition, Lectures, Conversation. Professors BLACKWELL and WIENER.

6, 7 and 8. In French, Victor Hugo's La Chute (from Les Miserables), Moliere's Tartuffe, Corneille's Cid, Racine's Athalie, Voltaire's Merope, Daudet's Tartarin de Tarascon and L'Evangeliste, Composition, Lectures, Conversation. Professors BLACKWELL, WIENER and GENTRY.

An elective course of two semesters in Conversational and in Scientific French and German is proposed.

Enrollment of students in this Department for the year 1892-93 was 291.

V. Department of Semitic Languages.

J. S. BLACKWELL, Professor.

There were two classes in Hebrew in 1892-93, and they continued the work through the year.

HEBREW.

1. Bissell's Hebrew Grammar, Genesis.
2. Books of Ruth and Esther, Green's Grammar.
3. Harper's Syntax, The Psalms, Driver's Tenses, Ancient History.
4. Study of Isaiah (Alexander, Cheyne and Delitzsch), Wickes' Accent.

Graduate studies will include post-biblical literature, the Pirke Aboth from the Mishna (Taylor), and the Pentateuchal Question.

(Delitzsch, Dillman, Welhausen, Kuenen, Bissell, Harman, Harper, Green and others.)

ARAMAIC.

1. Brown's Grammar and Reader.
 2. The Targums.
- Two semesters of Hebrew are necessary for entrance.
No class in 1892-93.

SYRIAC.

1. Nestle's Grammatik and Chrestomathie.
 2. Bagster's Peshitto New Testament and Lexicon.
- Two semesters in Hebrew necessary for entrance.
No class in 1892-93.

ARABIC.

1. Lansing's Grammar and Chrestomathy.
 2. Wright's Reading Lessons, Wortabet's Dictionary, first two surahs of the Koran.
- Two semesters of Hebrew necessary for entrance.
No class in 1892-93.
A course of lectures in the Normal School is given every year.

VI. Department of Sanskrit.

J. S. BLACKWELL, Professor.

1. Perry's Sanskrit Primer, Whitney's Grammar.
2. Story of Nala, Hitopadeca, Dharmacastra.
3. Hymns to Agni and Varuna, and the Funeral Hymns of the Rigveda, Brahmanas.

A class pursued this work through the year; also, a class in Classical Persian was formed, as it was called for.

VII. Department of Comparative Philology.

_____, Professor.

VIII. Department of History and Political Economy.

FREDERICK CHARLES HICKS, Professor.

First Semester—

1. Ancient and Mediæval History. Text-book. Wednesday and Friday, 2 p. m.
3. History of England. Text-book. Wednesday, Friday, 3 p. m.
5. Theory of Economics. Lectures. Tuesday, Thursday, Saturday, 12 m.
7. Problems in Economics (Social). Lectures and Topics. Tuesday, Thursday, Saturday, 3 p. m. Course 7 must be accompanied or preceded by Course 5.
9. Political Institutions. Text-book. Wednesday, Friday, 12 m. Course 9 must be preceded by Courses 1 and 2.
11. Seminary in History. Topics. Wednesday, 4-6 p. m. Course 11 is intended for advanced students.

Second Semester—

2. Modern History. Text-book. Wednesday, Thursday, Friday, 3 p. m.
4. Political History of the United States. Text-book. Wednesday, Friday, 2 p. m.

6. History of Industrial Development. Lectures. Tuesday, Thursday, Saturday, 12 m.
8. Problems in Economics (Industrial). Lectures and Topics. Tuesday, Thursday, Saturday, 3 p. m. Course 8 must be preceded by Course 5.
10. Political Institutions of the United States. Text-book. Wednesday, Friday, 12 m. Course 8 must be preceded by Course 4.
12. Seminary in Economics. Topics. Wednesday, 4-6 p. m. Course 12 is intended for advanced students.

REQUIRED WORK.

COURSE 1—Ancient and Mediæval History is required of students in the A. B. and L. B. courses during the first semester of the Sophomore year.

COURSE 2—Modern History is required of students in the L. B. course during the second semester of the Sophomore year.

COURSE 3—History of England is required of students in the L. B. and S. B. courses during the first semester of the Sophomore year.

COURSE 5—Theory of Economics is required of students in the L. B. course during the first semester of the Junior year.

COURSE 6—History of Industrial Development is required of students in the L. B. course during the second semester of the Junior year.

IX. Department of Philosophy.

[A Professor is soon to be elected for this Department. During the current year it has been in charge of Professor Blanton, who offered the following courses:]

First Semester—

Psychology. Recitations and Lectures. Text-book: Murray's Hand-book.

Second Semester—

Logic. Recitations and Lectures. Text-book: Jevon

ethics. Recitations and Lectures. Text-book: Murray.

A course of reading in the history of philosophy will be required.

X. Department of Mathematics and Astronomy.

W. B. SMITH, Professor. W. C. TINDALL, Associate Professor. MILTON UPDEGRAFF, Assistant Professor and Director of Observatory.

(Arabic numerals in parenthesis indicate the enrollment for 1892-93.)

The following courses are offered:

1 and 2. Solid Geometry, Plane and Spherical Trigonometry.—Thrice weekly, both semesters, Freshman.—UPDEGRAFF. (84)

Text: Hayward's Solid Geometry, Smith's Clew to Trigonometry.

3 and 4. Advanced Algebra.—Twice weekly, both semesters, Freshman.—TINDALL. (25)

Text: Smith's Treatise on Algebra, from chapter XIX.

5 and 6. Co-ordinate Geometry.—Thrice weekly, *first semester*; fourtimes weekly, *second semester*, Sophomore.—TINDALL. (23)

Text: Smith's Co-ordinate Geometry.

7 and 8. General Astronomy.—Thrice weekly, both semesters, Junior.—UPDEGRAFF. (6)

Text: Young's General Astronomy.

Of the foregoing courses there are prescribed 1; 2, 5 for the degrees of A. B. and L. B., and all but 7 for the degree of S. B.

ELECTIVES.

9 and 10. Infinitesimal Calculus (double course).—Six times weekly, both semesters, Junior.—SMITH. (10)

Text: Greenhill's Calculus, 2d edition.

11 and 12. Theory of Equations and Quantities.—Thrice weekly, both semesters, Junior.—TINDALL. (3)

Text: Burnside and Panton's Theory, etc.

13 and 14. Solid Co-ordinate Geometry.—Thrice weekly, both semesters, Senior.—TINDALL. (6)

Text: Frost's Solid Geometry.

15 and 16. Differential Equations.—Four times weekly, both semesters, Senior and Graduate.—SMITH. (3)

Text: Forsyth's Treatise on Differential Equations.

17 and 18. Elliptic Functions.—Four times weekly, both semesters, Graduate.—SMITH. (3)

Text: Halphen's *Traite des Fonctions Elliptiques*.

19 and 20. Elliptic Functions—Advanced Course.—Four times weekly, both semesters, Graduate.—SMITH.

Text: Halphen's *Traite*, Vol. II.

21 and 22. Modern Higher Algebra—Theory of Substitutions.—Thrice weekly, both semesters, Graduate.—TINDALL.

Texts: Salmon's and Netto's.

23 and 24. Mathematical Seminary (for orientation in various mathematical disciplines and for incitement to original research).—Twice weekly, both semesters, Graduate.—SMITH. (3). Subjects treated in 1892-93 were Local Probability (Czuber) and Hyperspaces (Killing).

25 and 26. Practical Astronomy.—Thrice weekly, both semesters, Junior.—UPDEGRAFF. (3)

Text: Greene's Spherical and Practical Astronomy.

27 and 28. Practical Astronomy.—Four times weekly, both semesters, Senior and Graduate.—UPDEGRAFF. (2)

29. Least Squares.—Thrice weekly, *second semester*, Junior.—UPDEGRAFF.

30. Determinants.—Twice weekly, *first semester*. Sophomore.—Tindall. (8)

Text: Muir's Theory of Determinants.

Courses 3 and 4 are continued in 11 and 12; Courses 5 and 6, in 13 and 14; Courses 9 and 10, in 15 and 16, which may themselves be extended on demand into the Theories of Linear and of Partial Differential Equations—a series especially recommended to students of Engineering. Courses 13-24 are designed for teachers and special students of Mathematics.

The general condition of admission to any course is knowledge presumably adequate to profitable pursuit of the subject in hand. For admission to the Freshman classes there is required the equivalent of the Preparatory Courses outlined below, and *examination for such admission will be based upon the texts there mentioned*, viz.: Smith's *Elementary Algebra*, Smith's *Treatise on Algebra* (to Chapter XIX), and Smith's *Introductory Modern Geometry*—all published by Macmillan & Co.

PREPARATORY COURSES.

[Courses Ia and Ib are discontinued from June 1893, and Courses IIa and IIb will be discontinued from June 1894.]

These, hitherto required by the law of the State, extend through two years, as follows:

Ia. Elementary Algebra (Smith's, 1-240), thrice weekly, both semesters. (146)

Ib. Introductory Modern Geometry (Smith's, 1-148), twice weekly, both semesters. (161)

IIa. Algebra (Smith's Elementary completed, Smith's Treatise to Chapter XIX), thrice weekly, both semesters. (36)

IIb. Geometry (Smith's Introductory Modern completed), twice weekly, both semesters. (89)

Candidates for admission to any of these Courses must pass a satisfactory examination on Arithmetic. The classes are taught by instructors chosen with careful regard to mathematical attainment and to aptitude for teaching.

Total enrollment by classes, 706.

Total enrollment by individuals, 896.

THE LAWS OBSERVATORY.

MILTON UPDEGRAFF, Director.

The Observatory is pleasantly situated on the campus, and is equipped with the following instruments:

(1) A 7½-inch refracting Equatorial Telescope, by Merz und Mahler, of Munich, furnished with a driving clock, position filar micrometer, two spectroscopes, by Fauth & Co., eye-pieces and adapters.

(2) A 2 $\frac{1}{6}$ -inch Transit Instrument, by Brunner, of Paris, with a divided circle in declination, read by two verniers to 3 seconds of arc.

(3) An Altitude and Azimuth Instrument, by Blunt, of New York, aperture 2 inches, and also a Sextant by the same maker.

(4) A Sidereal Clock by Fauth & Co., of Washington, a Mean Time Clock by Gregg & Rupp, of New York, and a Sidereal Break-circuit Chronometer, by Wm. Bond & Son, of Boston.

(5) A Chronograph, by Fauth & Co., Theodolite, by Gregg & Rupp, 20-inch Celestial Globe, Barometer and Thermometers, by H. J. Green, of New York, electrical apparatus, and other smaller instruments.

The clocks and instruments are connected with each other by means of insulated copper wire for the transmission of electric signals, and a double line of telegraph wire

connects the Observatory with the Western Union Telegraph office in Columbia for the transmission of time signals. Both clocks and instruments are mounted on piers of solid masonry, isolated from the floors and walls of the building. The dome of the equatorial telescope is $17\frac{1}{2}$ feet in diameter, and is made of wood covered with sheet-iron. It is supported by an octagonal brick tower at the east end of the building, and revolves on wheels that run on a cast-iron track. The telescope is mounted on a wooden stand which rests on a brick pier. A portion of the west end of the building is surmounted by a cone 14 feet in diameter, which revolves on cannon balls and shelters the altitude and azimuth instrument. The transit room has three slits in the walls and roof for observation, and contains the transit instrument, chronograph and sidereal clock. An office 15×18 and a library room 15×12 with basement 15×30 have been recently erected adjoining the west end of the Observatory building.

The course in Practical Astronomy comprises instruction in the theory of instruments, in the solution of the more important problems of Spherical Astronomy, in the use of portable instruments for the determination of Time, Latitude, Longitude and Azimuth, and also in the computation of predictions of eclipses of the sun and moon and transits of the inferior planets. Whenever possible, observations of these phenomena are made by the student, under the supervision of the professor, and thus the accuracy of both computation and observation is tested. When sufficiently advanced, students may undertake a series of micrometric observations with the equatorial telescope, and also the mathematical calculations involved in the reduction of the same. Instruction in the determination of the orbits of comets and planets will be given to students who are fitted to undertake this class of work.

A prize, namely, a medal suitably engraved, is offered yearly for attainments sufficiently high in Astronomical study and research, as evinced by examination and thesis, and is open to all seniors that reach a certain standard of general excellence.

XI. Department of Physics.

JOSEPH G. NORWOOD, Professor Emeritus. MILLARD L. LIPSCOMB, Professor. WILLIAM SHRADER, Assistant Professor. M. H. LOCKWOOD, Tutor.

The instruction in Physics consists of recitations, lectures, lecture-room experiments and laboratory work, and comprises the following courses:

1. Recitations and lectures three times per week during the first semester of the second preparatory year, attended by all students, in which the whole subject of physics is discussed in an elementary manner and fully illustrated by experiments. This course will be discontinued after session 1893-94.
2. Recitations and lectures four times per week in the second semester of the Sophomore year. Subjects: Mechanics, Sound and Heat. Requisite for admission, grades in all mathematics up to the first semester of the Sophomore year. Required in the Scientific and Engineering Courses, elective in the A. B. and L. B. Courses.
3. Recitations and lectures twice per week. Subject: Electricity and Magnetism. Requisite for admission, same as in Course 2. Required in Scientific and Engineering Courses, elective in A. B. and L. B. Courses.
4. Laboratory. Two hours a week through the first semester of the Junior year. Requisite for admission, a grade in Course 3. Required in the Scientific and Engineering Courses, elective in the A. B. and L. B. Courses.

5 Recitations and lectures. Subject: Optics. Requisite for admission, same as Course 2. Required in Scientific and Engineering Courses, elective in A. B. and L. B. Courses.

6. Laboratory. Four times a week through the second semester of the Junior year. For courses in Physics in the Engineering Courses, see Engineering.

7. The practical application of Electricity in Medicine and Surgery.

ELECTIVES.

To students in the A. B. and L. B. courses is offered the Physics laid down in the Sophomore and Junior years of the Scientific course.

To all Academic students the following courses are offered:

JUNIOR.

8. Laboratory. Two hours a week, *first semester*.

9. Special instruction in the construction and manipulation of apparatus for lecture table experiments. This course is especially intended for teachers. Three hours a week, *first semester*.

10. Electricity and Magnetism. Four hours a week, *second semester*.

SENIOR.

11. Mechanics. Four hours a week, *first semester*.

12. Laboratory. One hour a week, *first semester*.

13. Mechanical Theory of Heat (Clausius) or Thermodynamics. Five hours a week, *second semester*.

14. Special Laboratory work.

LABORATORY.

In addition to the instruction received in common with the other classes, the students in the scientific and engineering courses are required to take two hours per week during the first semester of the Junior year, and four hours per week during the second semester of the Junior year, in the Physical Laboratory.

The work consists of precise weighings, determinations of densities, verification of the laws of elasticity and capillarity, determinations of the intensity of gravity, barometric readings and reductions, magnetic declination and inclination, horizontal intensity of the earth's magnetism, variation of magnetic intensity, magnetic moment, temperature co-efficient of magnets, measurement of resistance of conductors and batteries, electric-motive forces, potentials, capacities, strength of currents, calibration of rheostats, verification of the laws of sound and radiant heat, determinations of specific and latent heats, expansions and vapor densities, radii of curvature of lenses and mirrors, focal lengths, wave lengths, indices of refraction, angles of crystals and verifications of the laws of diffraction and interference.

The students study spectrum analysis, learn the use of the microscope, and in polarized light determine the rotation of the plane of polarization, percentage of sugar in solutions by means of saccharimeter, experiment with double refracting bodies, distinguish between positive and negative crystals, determine angle of optical axes of crystals, etc.

Advanced laboratory work and reading courses in Physics will be given to suit the individual needs of special students.

GRADUATE WORK.

The following courses are opened (1) to graduate students, (2) to undergraduates under certain conditions:

15. Thermodynamics. Two hours.

16. Theory of Electricity and Magnetism (Mascart-Joubert). Three hours.

17. Readings and Discussions. One hour.

18. Absolute measurements in Electricity and Magnetism. Laboratory practice in the determination of current, electromotive, resistance, electric capacity, and the magnetic elements in absolute measure.

19. Thermometry and Calorimetry. Laboratory practice, including the study of the thermometer as an instrument of precision, method of measuring temperature, thermal capacities and influence of temperature upon physical constants. Three hours.

20. Advanced laboratory work in general Physics. This course is intended to meet the wants of those intending to teach experimental physics. Time will be arranged to suit the student.

Other courses will be given to meet the individual needs of students.

PHYSICAL APPARATUS.

The instrumental equipment of the Department of Physics was almost entirely destroyed by the fire of January 9, 1892, but has been replaced by apparatus especially selected for accurate measurements. The instruments are of the most approved forms, principally bought of the following renowned makers: Queen, Ritchie, Becker and Green of this country; Browning, Patterson and Cooper, and Elliott Bros., London; Hartmann and Braun, and Edelmann, Germany; Duboscq, Demeritens, and Breguet, and Koenig, Paris; Societe Genevoise, Geneva.

Text-books: Maxwell's Theory of Heat, Deschanel's Heat, Pt. II, Sheldon's Olmsted's Physics, Anthony & Brackett's Physics, Atkinson's Dynamic Electricity, Liebig and Rohe's Practical Application of Electricity in Medicine and Surgery, Mascart and Joubert's Elect. and Magnetism, Schellen's Spectral Analysis, Stewart & Gee's Practical Physics, Glazebrook & Shaw's Practical Physics, Kohlrausch's Physical Measurements, and Gray's Absolute Measurements.

For Laboratory fees see "Fees and Expenses."

Enrollment of students, 1892-93, 210.

XII. Department of Chemistry.

PAUL SCHWEITZER, Professor.

FREDERICK HOMBURG, Assistant Professor.

* SILAS DINSMOOR, Assistant.

C. L. HARE, Assistant.

I. ARRANGEMENT OF CLASSES BY SEMESTERS.

First Semester—

- 11-12 (4 hours). Phenomenal Chemistry.
 8 hours Laboratory work, divided according to plan into
 3 hours Young Chemist,
 5 hours Qualitative Analysis.

ELECTIVES.

- 3 hours Applied Chemistry.
 3 hours Organic Chemistry.
 3 hours Qualitative Analysis.
 3 hours Quantitative Analysis.

Second Semester—

- 11-12 (4 hours). Phenomenal Chemistry.
 8 hours Laboratory work, divided according to plan into
 3 hours Young Chemist.
 5 hours Qualitative Analysis.

- 10-11 (3 hours). Rational Chemistry.

ELECTIVES.

- 3 hours Agricultural Chemistry.
 3 hours Physiological Chemistry and Toxicology.
 3 hours Qualitative Analysis.
 3 hours Quantitative Analysis.

II. SYNOPSIS OF WORK.

1. *Phenomenal Chemistry*, 4 hours, an elementary course of instruction, consisting in experimental demonstrations of the facts of the science, and embracing both the metalloids and the more common of the metals; calculations of quantities by weight and volume, of changes in the volume of gases by changes of temperature and pressure, writing of reactions and establishing of formulas upon proper physical facts, accompany the work. (Ira Remsen: *An Introduction to the Study of Chemistry*.)

2. *Chemical Laboratory*, 8 hours, divided as indicated above between work in which the use of apparatus and the art of making experiments are taught—the experiments being simple and illustrative of the properties of the more common of the elements and their compounds (Appleton: *The Young Chemist*)—and practice in qualitative analysis, separating and detecting all of the more common bases and acids in simple compounds and in complex mixtures. (Curtman: *Lessons in Qualitative and Volumetric Chemical Analysis*.)

3. *Rational Chemistry*, 3 hours; the principles of Chemical Philosophy, with a review of inorganic chemistry. (Cooke: *Principles of Chemical Philosophy*, Part I.)

* On leave of absence.

ELECTIVES.

4. *Applied Chemistry*, 3 hours; *Air*, respiration, vitiated air and ventilation; infection, contagion, germ theory of disease. *Water*, potable water, hard and soft; impurities in it, such as lead and sewage matter, and their effects upon health and life; mineral and other waters. *Food*, composition and general properties; *bread, meat, milk, sugar*; preservation of food, and food adulterations. *Illuminants, Disinfectants, Antiseptics*.

5. *Organic Chemistry*, 3 hours; a general view of subject; detailed treatment of monatomic alcohols, acids and derivatives; aromatic compounds; compound ammonias, alkaloids. (Ira Remsen: *An Introduction to the Study of the Compounds of Carbon*.)

6. *Agricultural Chemistry*, 3 hours; general introduction; functions of the plant, including production, conversion, transportation, deposition of organic matter; physiological structure of the cell; respiration; the green cell an apparatus for doing work dependent upon light and heat; nitrogenous constituents of the plant and their relation to free and combined nitrogen; mineral constituents; membranous diffusion; assimilation; conditions of vegetation.

Soil, its formation, composition, alteration by mechanical, chemical, biological agencies; its relation to light, heat and moisture.

Manures, natural and artificial; their composition, application, value.

7. *Physiological Chemistry and Toxicology*, 3 hours; general introduction; constituents of the body; inorganic, histogenic and products of retrogressive metamorphosis; blood and related fluids; milk and other secretions; urine, healthy and pathological.

Poisons, their classification, description, recognition; action of poisons; their detection and isolation in judicial investigations.

8. *Laboratory work*, 3 hours, qualitative analysis; twice 3 hours, quantitative analysis, as may be determined upon. For Laboratory fees see "Fees and Expenses."

Number of students in this Department, 297.

XIII. Department of Geology and Mineralogy.

G. C. BROADHEAD, Professor; W. W. CLENDENIN, Assistant Professor; M. H. LOCKWOOD, Tutor.

MINERALOGY AND LITHOLOGY.

Students in Science and Engineering courses are required to take the course in Mineralogy and Lithology. The time occupied may be found in the schedule. One afternoon each week is devoted to Laboratory work.

Students in Arts and Letters may elect the course in Mineralogy.

In Physical Mineralogy, students will also receive instruction in Crystallography, including the measuring of angles of crystals, their physical characters, such as H., Sp. Grav., polarized light, etc.

In the study of minerals the most important will be considered, including the rock-making species (*a*), chief ores (*b*), the gems (*c*), and those of economic value (*d*).

The course of Lithology embraces the study of the composition, structure and origin of the most important rocks.

To students who elect special work in Mineralogy and Lithology will be furnished facilities for work in Mathematical Crystallography and optical investigations of minerals and rocks; also a systematic and comprehensive course in Mineralogy.

Fees to cover use of apparatus and material will be charged.

For admission into class in Mineralogy students must have taken a course in Chemistry.

PHYSICAL AND ECONOMIC GEOLOGY AND MINERALOGY.

Instruction in this course will be given to the Agricultural and Engineering students. The instruction will be chiefly by lectures upon Economic Geology and Mineralogy, Lithology, Physical Geography and Geological Surveying, embracing the study of building materials, decomposition of rocks and production of soil, useful minerals, their occurrence in veins and beds; coal deposits, useful mineral substances, and surface Geology and its application to Engineering and Agriculture.

Text-book: Williams' Applied Geology.

The rich mineral resources of Missouri will be freely discussed, and its Geology often referred to.

Advanced students in Geology will devote a large portion of their time to the study of Palæontology and the determination of fossils, with occasional practice in Field Geology. The course in Palæontology will be mainly by lectures and the study of fossils.

To students who elect a special course, opportunity for field-work will be given during both semesters.

Students in Geology are expected to have previously studied Physical Geography, Zoology and Chemistry. The course in Physical Geography is quite thorough.

Text-book: Appleton's Physical Geography.

Text-book for Geology: Le Conte's Elements.

Text-book for Mineralogy: Dana. Books of reference, Dana's Geology.

The Geology of Missouri will be often discussed and its structure fully explained.

ELECTIVE COURSES.

Full opportunity will be given students to continue the course in Mineralogy for an additional semester, or longer, if so desired. This will include—

- A. 1. Physical Mineralogy, Crystallography and Physical Properties of Minerals.
2. Laboratory work relating to the above, with Microscopic work.
- B. Descriptive and Determinative Mineralogy, with Laboratory work.
- C. Lithology, with such Laboratory work as we are prepared for.
- D. Discussion of Ores, Mines and Mining.
- E. Metallurgy and Assaying.

To students who have already taken a semester's work in Mineralogy, the Elective course will consist of additional studies of minerals and their complete determination. As far as practicable, they can add microscopical as well as macroscopical studies of both minerals and rocks.

The following is a general statement of the character of the regular course, as well as the

ELECTIVE COURSE IN GEOLOGY.

Students in Arts and Letters may elect the course in Geology. Full opportunity will be given students to continue the course in Geology and Palæontology for an additional session, and to take also additional field-work.

First Semester:

Physiographic and Lithologic Geology (one week).

Dynamical and Structural Geology.

Occasional Geologic excursions.

Applied (Economic) Geology.

Missouri Ores.

Study of Fossils.

Thesis and monthly discussions and criticisms in seminary.

Second Semester:

Historic Geology and Palæontology, with Laboratory and field-work.

The course in Geology includes the form and features of the earth, its physical changes due to atmospheric agents and to temperature, trend of mountain ranges, erosion and transportation of sediments.

Lithological Geology—Definition of minerals and rocks, classification of rocks.

Dynamical Geology—Glaciers, drift, chemical agents, formation of caves, deposits in springs, salt lakes, alkaline lakes, organic agencies, formations of peat, coal, iron ore, coral reefs; volcanoes, earthquakes, elevation and depression of earth's surface, mountain-making.

Structural Geology—General form of the earth, its crust, continental form, stratified rocks, how formed, how changed; folds, faults, dip, cleavage, etc.; structures common to all rocks, mineral veins, metamorphism, igneous rocks.

Economic Geology—Substances used in the arts, building stones, limes, clays, fuels, minerals, ores.

Classification of soils—how formed and reclaimed; fertilizers; water supply; Missouri ores described, their occurrence, distribution; related minerals and value.

Thesis and monthly discussions.

HISTORIC GEOLOGY AND PALÆONTOLOGY.

Reference, Nicholson's Palæontology, Meller's Palæontology, and State and U. S. Surveys.

Classification of strata and their distribution, as related to Missouri; use of fossils and how formed; description of chief palæozoic forms of life, their advent, culmination, decline or extinction; carboniferous flora and formation of coal, and area of coal fields; animal life of each age; age of various mountain systems, how and when formed; Appalachian, Alpine, Ozark uplift.

Geological excursions when practicable, Geologic drawing, Thesis.

Students who have already taken the S. B. course in Geology may supplement their work by additional studies in Historic Geology and Palæontology, including a determination of characteristic fossils; the formation and relative age of the various mountain systems; the whole supplemented by Lectures on Economic and Areal Geology.

Total number of students in the Department for 1892-93, 96. For Laboratory fees see "Fees and Expenses."

XIV. Department of Biology.

GEO. D. PURINTON, Professor; W. R. DODSON, Assistant.

BOTANY.

The course includes a study of the fundamental principles of Vegetable Morphology, Plant Nutrition and Physiology, and Plant Analysis.

The object of the course is to fit the student for the higher work in Botany, and to meet the requirements of the Normal and Agricultural Courses in Biology as at present constituted in the University.

Text-books: Gray's School and Field Book of Botany, Purinton's Plant Analysis.

All students in the Scientific Course are required to take an advanced course in Botany during the spring term of the Freshman year. This course is also open to classical and literary students who may elect Science. Elective courses in Botany are also offered as shown in the appended table of elective studies.

ZOOLOGY.

Preparatory students, whether at the University or in the approved schools, are required to take one term in Elementary Zoology, accompanied by simple dissections in the Laboratory. This course will be discontinued in A. B. course after session 1892-93, in L. B. and S. B. courses after session 1893-94.

The Advanced Course for Scientific students begins with the commencement of the Freshman year and continues for one term, and is open alike to Classical and Literary students.

The course consists of lectures on Comparative Anatomy and Physiology, Histology, Embryology, the Mental Traits and Habits of the Lower Animals, and the Natural History of Man.

The course is accompanied by Laboratory practice with the microscope, and illustrated by views with the stereopticon.

THE BIOLOGICAL LABORATORY.

The Biological Laboratory is supplied with Bausch and Lomb, Crouch and Nachet microscopes, hand microtomes, a large and superior Thoma microtome, turn-tables, and various accessories for the critical histological study of vegetable and animal tissues.

Science students are required to spend three afternoons of each week during the fall term of the Sophomore year in the Biological Laboratory, and the same course is open to students in the Classical and Literary Courses. The course includes a study of the minute anatomy of common phanerogams, and such ordinary cryptogams as are obtainable, and the microscopic fungi (rusts, smuts, moulds, and plant diseases in general).

For Medical students there is a course in Botany, embracing lectures in Plant Physiology and Nutrition, for three days in each week, extending through the fall term.

A course in Economic Botany for Engineering students is given upon two days in the week in the spring term.

A short two months' teachers' course in Botany and Zoology is given during the months of April and May.

Electives in Biology.

The following elective courses are offered to all students of the University:

ZOOLOGY.

First Semester:

- (a) Embryology, 2 times per week.
- (b) Mammalian Anatomy, including dissections in the laboratory, 5 times per week.
- (c) Practical Osteology, 5 times per week.
- (d) Ornithology, with Taxidermy, 5 times per week.
- (e) Economic Entomology, 3 times per week.

Second Semester:

- (a) Anatomical Technology of Vertebrates, 5 times per week.
- (b) Animal Histology, 3 times per week.

BOTANY.

First Semester:

- (a) Economic Botany (lectures), 3 times per week.
- (b) Vegetable Histology (laboratory), 3 times per week.
- (c) Bacteriology (lectures and laboratory), 2 times per week.

Second Semester:

- (a) Physiological Botany, 2 times per week.
- (b) Cryptogamic Botany, 3 times per week.
- (c) Lectures on Fungi, 2 times per week.
- (d) Microscopical Study of Fungi, 3 times per week.

GENERAL BIOLOGY.

First semester—Elementary General Biology. Two times per week.

Second semester—Elementary General Biology, continued. Two times per week.

Number of students in Biology during the year, 180.

THE MUSEUM.

Professor PURINTON, Curator.

A new and elegant building for the occupancy of the Biological and Geological departments and the Museum is in process of construction, and will be ready for use at the opening of the next school year, in September, 1893.

The Museum will be 48×100 feet, will be fire-proof, and will contain two stories, with ample space for the accommodation of extensive and varied collections.

The building will contain, besides the Museum, large and commodious lecture-rooms and laboratories, and will be well equipped with microscopes and all modern appliances for the critical study of Biology in its varied phases. By a recent act of the Legislature of the State, the entire Missouri collection at the World's Fair will be sent to the University (at Columbia and Rolla) in 1893, and remain there as a part of the permanent equipment of the Museum. The money value of this collection will be many thousands of dollars, and, added to the large number of valuable specimens saved from the Uni-

versity fire, will constitute an admirable cabinet, illustrative of the Natural History and other resources of the State.

The scientific value of these collections to the University will be very great.

For a statement of the Laboratory fees in the Biological department, see "Eees and Expenses."

COLLEGE OF AGRICULTURE AND MECHANIC ARTS.

All the schools of this College, including Agriculture, Horticulture, Mechanic Arts, Drawing and Veterinary Science, are open to such students of the other departments of the University as have the time and inclination to enter them.

For full details of courses of study and facilities for instruction, see pages 42, and following.

SCHEME OF ACADEMIC STUDIES.

On the opposite page will be seen the scheme of Academic studies, arranged in three groups or courses:

The Classical, leading to the degree of A. B.; the Literary, to the degree of L. B.; the Scientific, to the degree of S. B.

A slight examination will show that in the Classical course Latin and Greek predominate; in the Literary course, English and Modern Languages; in the Scientific course, Mathematics and the Sciences.

On reaching the Junior year, the candidate for a degree will choose such special lines of work as he finds suited to his taste and need. In the choice of electives, however, certain rules are laid down for his guidance.

REGULATIONS CONCERNING ELECTIVES.

1. In the Junior and Senior years, students in the Classical or A. B. course must elect twelve hours—that is, three hours each semester—from the electives offered in Latin, or Greek, or Roman or Greek History, or Comparative Philology; those in the Literary or L. B. course must elect twelve hours—that is, three hours each semester—from the electives offered in English (Language or Literature), or French, or German, or History (Mediæval or Modern), or Political Science; those in the Scientific or S. B. course must elect twelve hours—that is, three hours each semester—from the electives offered in Mathematics or in Science. The student may give the entire twelve hours to one department, or divide the time as he may deem proper among the eligible departments.

2. The student may apply the remaining hours of elective work to any Academic elective course (for which he is prepared) offered in the University, or to any regular academic study which is not required in the course that he is pursuing, or to a course in Pedagogy of not more than three hours a week, or to a course in Veterinary Science of not more than three hours a week, or to a course in Agriculture or Horticulture of three hours a week, in either Junior or Senior year.

By Academic course is meant one not given in any of the professional schools of the University.

3. When the student has elected a subject that he has not studied before, he must pursue it for at least two semesters unless the subject is completed in less time.

4. Seniors and Juniors who have Sophomore or Freshman work (or both) to make up, must give such work precedence over elective work in making out their cards.

5. No student shall change an elective after two (2) weeks from the date of his enrollment in the class.

Any student not a candidate for a degree may take any subject taught in the University, in any class for which, in the judgment of the head of the department, he is sufficiently equipt.

CONDITIONS OF ADMISSION.

For admission to the Freshman class in the A. B. course are required: Two years of Latin (including Cæsar); one year of Greek; two years of Algebra and Plane Geometry. In English, elementary Rhetoric and Composition, and advanced Grammar. For other subjects, see the table of Preparatory courses, p. 32.

For admission to the Freshman class of the L. B. course, the conditions are the same as for the A. B. course, except that no Greek is required, but elementary Physics, U. S. History and American Literature instead.

For admission to the Freshman class of the S. B. course, the conditions are the same as for the L. B. course, except that German or French may be substituted for Latin.

SCHEME OF STUDIES.*

A. B. <i>Freshman, First Semester.</i>	L. B. <i>Freshman, First Semester.</i>	S. B. <i>Freshman, First Semester.</i>
9-10. Latin 15 10-11. Greek, T. W. F. S. . . 4 12-1. Comp. and Rhetoric, W. F. 2 2-3. Geom. and Trig, T. Th. S. 3 *Science, T. W. F. S. 4	9-10. Latin 15 12-1. Comp. and Rhetoric, W. Th. F. 3 2-3. Geom. and Trig, T. Th. S. 3 3-4. Ger. or Fr., T. Th. S. 3 *Science, T. W. F. S. 4	9-10 or 12-1. Ger. or Fr., T. Th. S. 13 10-11. Biology, T. W. F. S. . 4 11-12. Chem., T. W. F. S. . 4 12-1. Comp. and Rhetoric, W. F. 2 2-3. Geom. and Trig . . . 5
<i>Freshman, Second Semester.</i>	<i>Freshman, Second Semester.</i>	<i>Freshman, Second Semester.</i>
9-10. Latin 5 10-11. Greek, T. W. F. S. . 4 12-1. Comp. and Rhetoric, W. F. 2 2-3. Geom. and Trig, T. Th. S. 3 *Science, T. W. F. S. 4	9-10. Latin 5 12-1. Comp. and Rhetoric, W. Th. F. 3 2-3. Geom. and Trig, T. Th. S. 3 3-4. Ger. or Fr., T. Th. S. 3 *Science, T. W. F. S. 4	9-10. or 12-1. Ger. or Fr., T. Th. S. 3 10-11. Biology, T. W. F. S. . 4 11-12. Chem., T. W. F. S. . 4 12-1. Comp. and Rhetoric, W. F. 2 2-3. Geom. and Trig . . . 5
<i>Sophomore, First Semester.</i>	<i>Sophomore, First Semester.</i>	<i>Sophomore, First Semester.</i>
9-10. Greek 5 10-11. Anal. Geom., T. Th. S. S. 3 11-12. English, T. Th. S. . 3 12-1. Latin 5 2-3. Anc. and Med. Hist. W. F. 2	9-10. Ger. or Fr., T. Th. S. 3 10-11. Anal. Geom., T. Th. S. 3 11-12. English, T. Th. S. . 3 12-1. Latin 5 2-3. Anc. and Med. Hist. W. F. 2 3-4. English Hist., W. F. 2	9-10. Ger. or Fr., T. Th. S. 3 10-11. Anal. Geom., T. Th. S. 3 11-12. English, T. Th. S. . 3 12-1. Minery, T. W. F. S. . 4 2-3. Biology, W. Th. F. S. 3 2-3. Eng. Hist., W. F. . . 2
<i>Sophomore, Second Semester.</i>	<i>Sophomore, Second Semester.</i>	<i>Sophomore, Second Semester.</i>
9-10. Greek 6 11-12. English, T. Th. S. . 3 12-1. Latin 5 Math. or Science . . . 4	9-10. Ger. or Fr., T. Th. S. 3 11-12. English, T. Th. S. . 3 12-1. Latin 5 2-3. Mod. Hist., W. Th. F. 3 Math. or Science . . . 4	9-10. Ger. or Fr., T. Th. S. 3 10-11. Physics, W. Th. F. S. 4 11-12. English, T. Th. S. . 3 12-1. Geology, T. W. Th. F. 4 12-1. Anal. Geom. 4
<i>Junior, First Semester.</i>	<i>Junior, First Semester.</i>	<i>Junior, First Semester.</i>
9-10. French, T. Th. S. . . 3 10-11. Latin, T. Th. S. . . 3 12-1. Greek, T. Th. S. . . 3 2-3. Ment. and Mor. Phil. 2 3-4. German, T. Th. S. . 3 Elective 4	9-10. Fr. or Ger., T. Th. S. 3 10-11. English, W. Th. F. 3 11-12. Gr. Ant., T. Th. S. . 3 12-1. Pol. Sci., T. Th. S. . 3 2-3. Ment. and Mor. Phil. 2 Elective 4	9-10. or 12-1. Fr. or Ger. T. Th. S. 3 10-11. English, W. Th. F. 3 11-12. Geology, T. Th. S. . 3 12-1. Physics, T. Th. S. . 3 2-3. Ment. and Mor. Phil. 2 Elective 4
<i>Junior, Second Semester.</i>	<i>Junior, Second Semester.</i>	<i>Junior, Second Semester.</i>
9-10. French, T. Th. S. . . 3 12-1. Greek, W. Th. F. . . 3 3-4. German, T. Th. S. . 3 Philosophy, W. F. . 2 Elective 7	9-10. or 12-1. Fr. or Ger., T. Th. S. 3 10-11. English, T. Th. S. . 3 11-12. Gr. Ant., T. Th. S. . 3 2-3. Ment. and Mor. Phil. 2 3-4. Pol. Sci., T. Th. S. . 3 Elective 4	9-10. or 12-1. Fr. or Ger. T. Th. S. 3 10-11. Chem., T. Th. S. . . 3 11-12. Astro'my, W. Th. F. 3 12-1. Physics, T. Th. S. . 3 2-3. Ment. and Mor. Phil. 2 Elective 4
<i>Senior, First Semester.</i>	<i>Senior, First Semester.</i>	<i>Senior, First Semester.</i>
9-10. Fr. or Ger., T. Th. S. 3 10-11. Ment. and Mor. Phil. 3 Elective 11	9-10. Fr. or Ger., T. Th. S. 3 10-11. Ment. and Mor. Phil. 3 Elective 11	9-10. Fr. or Ger., T. Th. S. 3 10-11. Ment. and Mor. Phil. 3 Elective 11
<i>Senior, Second Semester.</i>	<i>Senior, Second Semester.</i>	<i>Senior, Second Semester.</i>
9-10. Fr. or Ger., T. Th. S. 3 10-11. Ment. and Mor. Phil. 3 Elective 11	9-10. Fr. or Ger., T. Th. S. 3 10-11. Ment. and Mor. Phil. 3 Elective 11	9-10. Fr. or Ger., T. Th. S. 3 10-11. Ment. and Mor. Phil. 3 Elective 11

*Students may elect four hours of any scientific study or studies.

† If German be taken during the Freshman and Sophomore years, then French *must* be taken during the Junior and Senior years, and *vice versa*.

Military Science and Tactics may be taken in addition to the 18 hours of other subjects.

‡ The figure after each study indicates the number of recitations or lectures each week.

PREPARATORY COURSES.

FIRST YEAR.

	A. B.	L. B.	S. B.
First Semester	10-11 Mathematics.....*5 9-10. Latin..... 5 12-1 Physiology and Hygiene..... 4 2-3. Zoology..... 3 4-5. †Military Science or Book-keeping 3	10-11. Mathematics.....*5 9-10. Latin..... 5 12-1. Physiology and Hygiene..... 4 11-12 U. S. History..... 3 4-5. †Military Science or Book-keeping.... 3	10-11. Mathematics..... *5 9-10. †Latin, German or French..... 5 12-1. Physiology and Hygiene..... 4 11-12. U. S. History..... 3 4-5. †Military Science or Book-keeping.... 3
Second Sem.	9-10. Mathematics..... 5 12-1. Latin..... 5 11-12. English..... 5 10-11. Botany..... 3 4-5. †Military Science or Book-keeping 3	9-10. Mathematics..... 5 12-1. Latin..... 5 11-12. English..... 5 10-11. Botany..... 3 4-5. †Military Science or Book-keeping.... 3	9-10. Mathematics..... 5 12-1. Latin, German or French..... 5 11-12. English..... 5 10-11. Botany..... 3 4-5. †Military Science or Book-keeping.... 3

SECOND YEAR.

First Sem.	12-1. Mathematics..... 5 10-11. Latin..... 5 3-4. English..... 5 9-10. Greek..... 5	12-1. Mathematics..... 5 10-11. Latin..... 5 9-10. English..... 5 11-12. Physics..... 3 2-3. Zoology..... 3	12-1. Mathematics..... 5 10-11. Latin, German or French..... 5 9-10. English..... 5 11-12. Physics..... 3 2-3. Zoology..... 3
Second Sem.	12-1. Mathematics..... 5 10-11. Latin..... 5 11-12. Phys. Geography 5 9-10. Greek..... 5	12-1. Mathematics..... 5 10-11. Latin..... 5 11-12. Phys. Geography 5 3-4. Amer. Literature.. 2 3-4. Civil Government.. 3	12-1. Mathematics..... 5 10-11. Latin, German or French..... 5 11-12. Phys. Geography 5 3-4. Amer. Literature.. 2 3-4. Civil Government.. 3

*The figure opposite each subject indicates number of hours per week. †Optional.

‡Those who elect two years of German or French in the Preparatory Science course, in place of Latin, will be excused from German or French in the University course, but must elect an equivalent, approved by the Faculty.

EXPLANATION.

- I. MATHEMATICS above means Algebra and Plane Geometry. The texts are Smith's Elementary Algebra (complete) and Smith's Treatise on Algebra (as far as Chapter XIX); and in Geometry Smith's Introductory Modern Geometry (complete except latter half of Exercise V). Throughout the two years the classes in Algebra meet thrice and in Geometry twice per week. About 120 pages of Algebra and 75 pages of Geometry are studied each semester.
- II. LATIN First year, first semester: Collar and Daniell's Beginner's Latin Book, to page 103.
Second semester: The same completed.
Second year, first semester: Cæsar De Bello Gallico, Books II and III. Allen's Introduction to Latin Composition, to Lesson 16. Allen and Greenough's Grammar—careful review of Declensions and Conjugations.
Second semester: Cæsar De Bello Gallico, Books IV, V, I. Allen's Introduction, etc., to Lesson 32. Allen and Greenough's Grammar, coarse print of Syntax.

- III. ENGLISH. First year, first semester: Students are admitted who pass a satisfactory examination in English grammar.
 Second semester: Composition and Rhetoric. Text-book: Williams' Rhetoric. English Classics.
 Second year, first semester: English Language. Text-books: Meiklejohn, and Rolfe's Shakspeare's Tempest.
 Second semester: American Literature. Text-book: Hawthorne and Lemmon's American Literature. American Literature Series.
- IV. GREEK. Second year: White's Beginner's Greek Book, complete. First Greek Reader (Moss).
- V. GERMAN. First year, first semester: Whitney's Brief Grammar. Whitney's Short German Reader.
 Second semester: Whitney's Revised Grammar. Reader completed.
 Second year, first semester: Buchheim's Prose Composition, Schiller's Maria Stuart.
 Second semester: Buchheim continued, Eichendorff's Aus dem Leben eines Taugenichts.
- VI. FRENCH. First year, first semester: Whitney's Brief French Grammar and Brief Reader.
 Second semester: The same completed. Merimee's Colomba.
 Second year, first semester: Whitney's Larger Grammar, Saddler's Translating English into French, Le Roman d'un Jeune Homme Pauvre.
 Second semester: Grammar and Saddler continued, Victor Hugo's Bug Jargal.
- VII. BOOK-KEEPING. Principles of Single and Double Entry, with practice in the same by the student. Business Forms, etc. Text-book: Goodyear & Palmer's. Optional.
- VIII. MILITARY SCIENCE. Theoretic instruction in Infantry Drill Regulations, Artillery Tactics, Guard Manual, Art of War, Field Engineering, with practical exercise in Infantry and Artillery Drill, Guard duty, Encampment, Target Practice and Field Entrenchments. Optional.
- IX. BOTANY. Gray's School and Field Book of Botany completed; Purinton's Plant Analysis.
 ZOOLOGY. Packard's Briefer Course in Zoology and Colton's Practical Zoology, with dissections, completed.
- X. PHYSICAL GEOGRAPHY. Appleton's complete, with outlines of Meteorology and Geology.
- XI. PHYSICS. The text-book is Gillet and Rolfe's, with special attention to Mechanics, Heat, Electricity and Magnetism.
- XII. HISTORY AND GOVERNMENT. Johnston's The United States and Dole's The American Citizen. The former will perhaps soon be supplaccd by some work on General History.
- XIII. PHYSIOLOGY AND HYGIENE. Martin's Human Body—the subject treated topically, and the text largely supplemented by lectures.

The foregoing are recommended to High Schools as minimum courses. Many will be able to extend and strengthen these courses considerably, and all are encouraged to do so.

While there is no desire to prescribe text-books, those mentioned above are strongly recommended. If others are substituted, they should be of equivalent grade.

APPROVAL OF HIGH SCHOOLS AND ACADEMIES.

The full course of study pursued at the University as preparatory to the Freshman class is outlined above. This schedule of sub-Freshman work has been arranged in the belief that the majority of High schools and Academies in the State are prepared to adopt it. If any such school conform its own curriculum to any of these courses, such school shall, upon application to the President of the University, and on approval by the Faculty, be enrolled as "approved" in the University catalogue, and its certificate shall admit the bearer, without examination, to the Freshman class of such course or courses.

An approved school may, at its option, teach the five sciences in the above course, or it may devote the entire time to any two of them. In case any school does the latter, the sum total of science work required is reduced to two years, one-half of which must be given to each of the sciences chosen.

DISCONTINUANCE OF PREPARATORY COURSES.

The 37th General Assembly has so amended the law of the State as to relieve the University from what had seemed to be an obligation to maintain a preparatory department. The standard of admission under the amended law is left to the judgment of the Curators. The lower preparatory year will be discontinued after June, 1893; the upper (sub-Freshman) preparatory year will be discontinued after June, 1894.

LIST OF APPROVED SCHOOLS.

The following schools have been approved and their certificate will admit the bearer to the Freshman class without examination:

Name of School.	Location.	Name of School.	Location.
*Bethany High School 3....	Bethany.....	†Memphis High School 3...	Memphis.....
†California High School 4...	California.....	†Miami High School 3.....	Miami.....
†Cameron High School 4....	Cameron.....	†Mexico High School 3....	Mexico.....
†Carthage High School 4...	Carthage.....	†Milan High School 3.....	Milan.....
†Carrollton High School 3...	Carrollton....	†Missouri Military Acad. 4.	Mexico.....
†Chillicothe High School 4.	Chillicothe....	†Mound City High School 4.	Mound City...
†Clinton Academy 4.....	Clinton.....	†Mountain Grove Acad. 4..	Mount. Grove
†Clinton High School 3....	Clinton.....	†Neosho High School 3....	Neosho.....
†Cooper Institute 3.....	Boonville....	†Nevada High School 3....	Nevada.....
†Craig High School 4.....	Craig.....	†Odessa High School 3....	Odessa.....
†Ft. Smith High School 4 ..	Ft. Smith, Ark	†Otterville College.....	Otterville.....
†Hamilton High School 3...	Hamilton....	†Paris High School 4.....	Paris.....
†Hannibal High School 4...	Hannibal.....	†Perry Institute 4.....	Perry.....
†Harrisonville High School.	Harrisonville.	†Plattsburg High School 3.	Plattsburg...
†Higginsville High School 3	Higginsville..	†Richmond High School 3..	Richmond.....
†Hooper Institute 3.....	Clarksburg...	†Salem High School 4.....	Salem.....
†Independence High Sch. 3.	Independence.	†Salisbury Academy 4....	Salisbury.....
†Jefferson City High Sch. 4.	Jefferson City.	†Savannah High School 4..	Savannah....
†Joplin High School 4.....	Joplin.....	†Sedalia High School 4....	Sedalia.....
†Kansas City High School 4	Kansas City..	†Shelbina High School 4....	Shelbina.....
†Kemper Family School 4..	Boonville.....	†Slater High School 3.....	Slater.....
†Lamar High School 3.....	Lamar.....	†St. Joseph High School 4..	St. Joseph...
†Lancaster High School 3..	Lancaster.....	†St. James Mil. Acad. 4...	Macon.....
†Louisiana High School 3..	Louisiana.....	†St. Louis High School 4...	St. Louis.....
†Macon High School 3....	Macon.....	†Tipton High School.....	Tipton.....
†Marionville Collegiate In.	Marionville...	†Trenton High School 4...	Trenton.....
†Marmaduke Mil. Acad. 4.	Sweet Springs.	†Wentworth Academy 4...	Lexington....
†Marshall High School 3...	Marshall.....	†Westport High School 4...	Westport.....
†Maryville High School 4..	Maryville.....	†Windsor High School 3....	Windsor.....
†Mayfield-Smith Academy.	Marble Hill...	Total.....	59

*The figure attached to the name of the school indicates the number of years in the course of study.

†Articulated with all the Courses, Arts, Letters and Science.

‡Articulated with the Course of Letters and Science.

NOTE.—By an order of the Board of Curators, the student who attains the highest rank in the graduating class of any approved school will be permitted to enter the Academic department of the University or the Agricultural and Mechanical College without the payment of the first year's entrance and library fees.

II. THE PROFESSIONAL DEPARTMENTS.

OF THE

UNIVERSITY OF THE STATE OF MISSOURI.

- XV—1. AGRICULTURE AND MECHANIC ARTS.
- XVI—2. NORMAL INSTRUCTION.
- XVII—3. LAW.
- XVIII—4. MEDICINE.
- XIX—5. ENGINEERING (Civil, Mechanical and Electrical).
- XX—6. MILITARY SCIENCE AND TACTICS.
- XXI—7. ART.
- XXII—8. ELOCUTION.
- XXIII—9. MINING AND METALLURGY.

XV. College of Agriculture and Mechanic Arts.

FACULTY.

RICHARD HENRY JESSE, LL. D., President of the University,
Ex officio Chairman of the Faculty.

EDWARD D. PORTER, A. M., Ph. D.,
Dean of the Faculty and Professor of Agriculture.

PAUL SCHWEITZER, Ph. D.,
Professor of Chemistry.

EDWARD ARCHIBALD ALLEN, Litt. D.,
Professor of English.

WILLIAM BENJAMIN SMITH, A. M., Ph. D.,
Professor of Mathematics.

GEORGE DANA PURINTON, A. M., Ph. D., M. D.,
Professor of Botany, Entomology and Zoology.

GARLAND CARR BROADHEAD, M. S.,
Professor of Geology and Mineralogy.

CHARLES A. KEFFER, M. H.,
Professor of Theoretical and Practical Horticulture.

MILLARD LEWIS LIPSCOMB, A. M.,
Professor of Physics.

SAMUEL A. SMOKE, (Lieutenant U. S. Army),
Professor of Military Science and Tactics.

ALEXANDER MARTIN, A. M., LL. D.,
Lecturer on Agricultural Law.

CHRISTIAN WILLIAM MARX, B. E.,
Superintendent Mechanic Arts.

CHARLES BEMIS REARICK,
Assistant in Drawing and Mechanic Arts.

MELVILLE S. KING, M. Acc'ts.,
Instructor in Commercial School.

FREDERICK C. HICKS, Ph. D.,
Professor of History and Political Science.

HOWELL VAN BLARCOM,
Assistant in Mechanic Arts.

AGRICULTURAL EXPERIMENT STATION.

BOARD OF CONTROL:

The Curators of the University of the State of Missouri.

EXECUTIVE BOARD OF THE UNIVERSITY:

Hon. G. F. ROTHWELL, Hon. B. M. DILLEY, Hon. J. S. CLARKSON.

, ADVISORY COUNCIL:

The Governor of the State.
 The President of the Board of Curators of the University.
 The Master of the State Grange.
 The President of the State Board of Agriculture.
 The President of the State Horticultural Society.
 The Secretary of the State Horticultural Society.
 The Professor of Agriculture in the University of the State of Missouri.
 The Professor of Chemistry in the University of the State of Missouri.
 The Professor of Veterinary Science in the University of the State of Missouri.
 The Professor of Horticulture in the University of the State of Missouri.
 The Professor of Geology in the University of the State of Missouri.

OFFICERS OF THE STATION:

EDWARD D. PORTER.....	Director and Agriculturist
P. SCHWEITZER.....	Chemist
CHARLES A. KEFFER.....	Horticulturist
.....	Assistant Agriculturist
*PAUL EVANS.....	Veterinarian
CHARLES P. FOX.....	Assistant Chemist
A. C. VANDIVER.....	Farm Superintendent
IRVIN SWITZLER.....	Secretary
R. B. PRICE.....	Treasurer

This Station is made by the act of Congress of 1837, and by the acts of the General Assembly of Missouri, accepting its provisions and by the orders of the Board of Curators of the University of the State of Missouri, a department of the College of Agriculture.

The object of its organization is to aid in acquiring and diffusing among the people of the United States, useful and practical information on subjects connected with agriculture and to promote scientific investigation and experiment respecting the principles and application of agricultural science.

The results of these experimental investigations are given to the public from time to time in a series of bulletins or reports, which are furnished free of charge to any one applying for the same, to the Secretary of the Station, Columbia, Mo.

*Resigned.

COLLEGE OF AGRICULTURE AND MECHANIC ARTS.

(A DEPARTMENT OF THE UNIVERSITY.)

INTRODUCTION.

This College had its origin in the beneficence of National, State and local governments. Its location, objects and aims are defined in the following extracts from the acts of Congress and the laws of the State of Missouri.

Its leading objects shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the legislatures of the states may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life. (Act of Congress, 1862, Sec. 4.)

There is hereby established the Agricultural and Mechanical College, and a School of Mines and Metallurgy, provided for by the grant of the Congress of the United States, as a distinct department of the University of the State of Missouri. (Revised Statutes of Missouri, Sec. 8738.)

To effect the said leading objects of the colleges, as herein established, it is provided that the students and members thereof shall be admitted to the libraries, museums, models, cabinets and apparatus, and to all lectures and instructions of the University which now exist or may hereafter exist, and to all other rights and privileges thereof, in a manner as full and ample as are the students of any other department in said University; and to provide for instruction in military tactics, as herein required, it is enacted that in case a system of military education shall be established by Congress, the State University is hereby required by law to make the necessary provision for carrying out the plan so established in connection with the institution. (Revised Statutes, Sec. 8741, p. 2017.)

The Agricultural and Mechanical College, and the School of Mines and Metallurgy herein provided for, shall have each a separate and distinct faculty, whose officers and professors may be the same in whole or in part as the officers and professors in other colleges and departments of the University. (Revised Statutes of Missouri, Sec. 8742.)

In consideration of the permanent location of the Agricultural and Mechanical College in connection with the State University, the county of Boone shall donate not less than thirty thousand dollars in cash, to be used in erecting such buildings and making such improvements as may be needed for such college, and also for a Mechanical College in connection with the State University, and that the same shall be held for the uses and purposes of said Agricultural and Mechanical College. (Revised Statutes of Missouri, Sec. 8744.)

In accordance with the above provisions, the citizens of Boone county made a donation of ninety thousand dollars for the erection of necessary buildings and the purchase of lands for an experimental farm, and this college was permanently located at Columbia, in connection with the University of the State of Missouri and the School of Mines and Metallurgy at Rolla, under the same control and supported from the same congressional appropriations.

ENDOWMENT OF THE COLLEGE.

The support of the College is derived from:

1. The proceeds of the sales of the public lands donated to Missouri by the act of Congress of July 2, 1862. This State received as her share two hundred and seventy-five thousand acres, of which there have been sold up to date two hundred and sixteen thousand seven hundred and sixty acres, yielding three hundred and twelve thousand dollars, which sum is invested in a State certificate of indebtedness, at five per cent, yielding fifteen thousand six hundred dollars; of this amount one-fourth, or three thousand nine hundred dollars, is by law appropriated to the support of the School of Mines and Metallurgy, at Rolla.
2. The act of Congress of March 2, 1887, known as the "Hatch bill," appropriates fifteen thousand dollars annually to the College of Agriculture, for the purpose of conducting investigations and experiments in various lines of work connected with agriculture. By the acts of Congress making the above appropriations, the expenditures are expressly restricted to the purposes of instruction, illustration and original scientific investigations in agriculture, and not one dollar can be used for the erection or repair of buildings; such facilities are to be provided by the State of Missouri.
3. The annual appropriations from the United States treasury by the act of Congress of August 30, 1890, of fifteen thousand dollars for the years 1889-90, and increased each year by one thousand dollars, until it reaches twenty-five thousand dollars, which shall remain an annual appropriation. Of this amount, one-sixteenth is by law appropriated to the "Lincoln Institute," at Jefferson City, for the education of negro children in agriculture and mechanic arts, and one-fifth of the balance to the School of Mines and Metallurgy, at Rolla.
4. The College building and Experimental farm, donated by the citizens of Boone county, and costing originally ninety thousand dollars.

The above sums, together with the assistance derived from the association of the College of Agriculture with the University, furnish an abundant income for all purposes of instruction and experimentation.

GENERAL INFORMATION.

Applicants for admission to the College of Agriculture and Mechanic Arts should read carefully and follow the directions for new students. (See Index.) The Dean of the College will be found in his office in Agricultural hall at the opening of each semester, from 9 to 12 o' clock, to assist students in their examinations, to direct them to suitable homes, and to advise with them in reference to their classes and studies.

CONDITIONS OF ADMISSION.

Applicants for admission to the Freshman class must be not less than sixteen years of age, and must have completed the "Public School" course of the State.

Applicants for advanced classes in the course must sustain examination in the preparatory studies, and in all the book studies previously pursued by the class which they propose to enter; but if they have pursued such studies in any of the high schools of the State approved by the Faculty, or in other institutions of similar rank, they may receive credit for their standing in those institutions, upon presenting a certificate from the proper officers, showing that they have obtained a passing grade in courses of studies equivalent to those given here.

For the dates for examination and admission see the Calendar, p. 3.

BOARDING.

For board and other expenses, see "Boarding" in the Index.

COURSES OF STUDY.

The courses of study in the College of Agriculture and Mechanic Arts have been selected to fully meet the requirements of the acts of Congress providing for its organization, and while they are especially adapted to prepare students for the industrial pursuits of life, they are also sufficiently comprehensive, and of such a character as to secure the mental discipline and practical experience necessary for other callings and professions, and to qualify pupils for the duties and responsibilities of American citizenship.

AGRICULTURE.

First Year.

First Sem.—Lectures. History of Agriculture. Brief review of the chemical composition and physical properties of air and water. The origin, composition and practical classification of soils; properties, treatment and adaptation of soils to the various branches of husbandry. The improvement of soils, including drainage, subsoiling, fallowing and preparatory tillage. Fertilizers; their composition, preparation and application.

Second Sem.—Lectures on Farm Implements and Machinery, their construction and use. Farm crops; their history and adaptation to different soils and localities. Methods of seeding, cultivation and harvesting.

Second Year.

Second Sem.—Lectures. Farm Animals; their history and characteristics; their breeding, rearing, feeding and management.

Third Year.

First Sem.—Stock-breeding and Dairy Husbandry. These subjects will be taught by both lectures and text-books, with illustrations from the equipment and work of the College farm and Experiment Station.

Fourth Year.

First Sem.—Agricultural Engineering; selection of farms; location and construction of farm buildings; location, construction and repairs of public and private roads.

Second Sem.—History and organization of the system of Agricultural Experiment Stations, and the work accomplished.

Text-books and Books of Reference: Morton's Cyclopædia, Low's Practical Agriculture and Domesticated Animals, Storer's Agriculture, Miles on Stock-breeding, Thomas' Farm Implements, Johnson's "How Crops Grow" and "How Crops Feed," Stewart and Arnold on Dairying, Armsby and Stewart on Cattle Feeding, Bulletins and Reports of the Experiment Stations, and the Herd-books of the various Live-stock Associations.

FACILITIES FOR INSTRUCTION.

Libraries —A valuable library of agricultural books, papers and periodicals has been collected, to which additions are being regularly made. In addition to the Agricultural library, the students in the Agricultural College have access to the General library of the University and to the libraries of all the associated schools.

The Agricultural Museum.—This museum contains a large variety of objects especially adapted to illustrate the work in all departments of agriculture. There is an unusually

fine collection of wool and of cotton fibers, numbering about 600 specimens. These fibers represent most all civilized sections of the world. The wool fibers include the various breeds of sheep, affording as a whole, opportunity to study the influence of climate, soil and breed on wool fiber. Various fiber-producing plants are well represented, and are often accompanied by the various manufactured products. Nearly all of the woods of the State are represented by three feet of the trunk of such tree, so prepared as to show its heart and sap in the rough and under polish. The grasses of the State are represented by 125 species, collected by a graduate of the Agricultural College. In addition to the grasses of the State, the Museum contains one of the finest general collections of grasses in the country. In seeds it contains ninety Japanese varieties, 150 species of American farm seeds, and a great number of varieties of wheat, corn, oats and barley. It has 179 different grades of the milling products of wheat. It contains several hundred models of farm machinery. Sorghum and all its varied products are represented by forty-six objects. A large collection of miscellaneous materials of great value that cannot be enumerated. The list contains many woods and their products from the states of this country and from South America and Europe; also a long list of plants and their products.

In addition to these means of illustration, 318 lantern slides have been already collected of the larger number intended. These are found to be a very great aid to the lecture-room.

The Farm.—The farm is divided into two departments—Farm and Horticultural—both of which were well equipped with buildings, stock and tools of modern character, but owing to a disastrous fire in 1889, the barn, implements and machinery were totally destroyed. They have been partially replaced, and it is hoped that necessary appropriations will soon be made to thoroughly equip the farm for the best work. The farm consists of 768 acres of land of varying quality, and is well adapted to its purpose of instruction and experiment. The students will be required to perform such labor on the farm as is deemed necessary for the acquirement of proficiency in the methods taught, and will be compensated according to the character and amount of the work to be done, ten cents being the maximum pay per hour. In addition to this field labor, students will be required to perform farm labor whenever it is desirable to illustrate lecture-room teachings. Such work will be done without pay.

Experiments will be constantly carried on for the farming interests of the State and for lecture-room work. Students will be required to assist in these experiments.

HORTICULTURE.

Second Year, First Semester.—A course in methods of cultivation and management, three exercises a week. The work consists of lectures supplemented with required readings in the library, and frequent practical exercises.

The propagation, transplanting, cultivation, pruning gathering and marketing of fruits and vegetables are the principal topics discussed. Each student is required to make cuttings and grafts, prepare composts, sow seeds, transplant, prune, etc., performing as many of the various horticultural operations as the weather will permit.

Third Year, Second Semester.—Three exercises a week. This course consists of lectures on the theory of horticulture with especial reference to methods of cultivation and management as practiced in the Mississippi Valley. The student having had several courses in biology, physics and chemistry, is prepared for the application of these sciences to plant cultivation. The extensive experiments of the department afford abundant means of illustration.

Fourth Year, First Semester.—Three exercises a week. The work of this semester is divided between Forestry and Landscape Gardening. The course in Forestry consists

of lectures on the value, characteristics and cultivation of economic species of forest trees, with a discussion of scientific forestry. The lectures are supplemented with required readings, practical work in the forest-tree nursery and excursions to the natural woodlands near Columbia. The latter part of the semester is devoted to a short course of lectures on the laying out of farms and lawns, ornamental plants, planting, etc. The horticultural grounds are designed to illustrate the principles discussed.

Elective Courses.—Students in the Agricultural Department may elect additional work in Horticulture in the third and fourth years, and special courses are provided for such students, each carrying on an independent line of investigation, under the direction of the Professor in charge.

An elective course in Floriculture is offered in the second semester of the fourth year, consisting of the management of hot-houses, forcing flowers and propagation of flowers.

Elective courses in Horticulture, Forestry, Landscape Gardening and Floriculture can be arranged for academic students in the senior year.

FACILITIES FOR INSTRUCTION.

The grounds of the Horticultural Department include 32 acres, containing a well-planted lawn, with shrubbery and flower borders, large collections of all kinds of small fruits and grapes, and representative varieties of stone fruits, apples and pears. Many kinds of all the different vegetables are grown every year. A substantial propagating house, with grafting rooms and a good range of hot-beds, affords ample opportunity for teaching all methods of plant propagation. A complete equipment of spraying apparatus, tools and implements has been secured within the past year. The library contains all the best works on flower, fruit and vegetable culture in the English language, and the leading horticultural periodicals.

The department furnishes a limited amount of labor to its students, at the rate of 10 cents an hour. So far as possible such labor is arranged to illustrate the work of the class-room.

VETERINARY SCIENCE

Embraces an *elementary* and an *advanced* course.

The Elementary course is designed for students in the "Short course" of two years, and will be given by lectures, illustrated by plates, models, skeletons and prepared specimens of the various organs of domestic animals. This course is not designed to prepare young men for veterinarians, but to give them such practical knowledge of the anatomy, physiology and hygiene of domestic animals as will enable them to handle intelligently ordinary farm stock. The course will embrace Comparative and Human Anatomy; the ordinary diseases of domestic animals and their treatment; water supply for stock; ventilation of stables; varieties of food, their value and preparation.

The Advanced course, given during the "Four Year course," will embrace a thorough knowledge of the study, including Anatomy and Physiology, both human and comparative; general Pathology and Histology; practical Medicine and Surgery; Animal Obstetrics; Bacteriology, and the study of contagious and infectious diseases.

MECHANIC ARTS.

COURSE IN MECHANIC ARTS.

First year. WOOD-WORKING AND PATTERN-MAKING.—This course begins with a series of exercises in wood-working, each of which is intended to give the student familiarity with a certain application of a certain tool; and the course of exercises, as a whole, is expected to enable the industrious student easily and exactly to perform any ordinary operation familiar to the carpenter, to the joiner and the pattern-maker. Time permitting, these prescribed exercises are followed by practice in making members of structures, joints, small complete structures, patterns, their core-boxes, and other constructions in wood. Particular attention will be paid to the details of pattern-making.

Second year. FORGING, MOLDING AND FOUNDRY-WORK.—These courses are expected not only to give the student a knowledge of the methods of the blacksmith and the molder, but to give him that manual skill in the handling of tools which will permit him to enter the machine-shop and there quickly to acquire familiarity and skill in the manipulation of the metals, and in the management of both hand and machine tools.

Third year. MACHINE-WORK.—The instruction in the machine-shop, as in the foundry and at the forge, is intended to be carried on in substantially the same manner as in the wood-working course, beginning by a series of graded exercises, which will give the student familiarity with the tools of the craft, and with the operations for the performance of which they are particularly designed, and concluding by practice in the construction of parts of machinery, and, time permitting, in the building of complete machines, which may have a market value, and original work in construction of machines or parts of machines, or special devices.

COURSE IN DRAWING.

First year. Free-hand and Instrumental drawing, which is taught by lectures, and from objects, models, and flat copies, including intersections, development of surfaces, and lettering.

Second year. Mechanical drawing, isometric projections, plans, sections, and elevations of machines, and structures.

Third year. Geometrical drawing, tinting, brush and line shading; shades, shadows and original professional work.

FACILITIES FOR INSTRUCTION.

The building for the Department of Mechanic Arts was the first one of the group of five departmental buildings erected by the Board of Curators on the University campus during the present year. It has a frontage of 108 feet by a depth of 117 feet. It consists of two stories, and a full basement. It has six shop-rooms 40×40 feet, an exhibit hall 25×40 feet, two offices 16×18 feet, one drawing-room 40×40 feet, two class-rooms 18×22 feet, besides store-room, engine-room, lavatories, etc. The driving power of the machinery is a 90-horse power Corliss engine.

The building will accommodate 400 students by classes of 24 in a class, and two hours to a class each day.

The carpenter and pattern shop has accommodations for four classes of 24 pupils each.

Each pupil has one of the uniform sets of hand or edge tools for his exclusive use, kept in a locked drawer, for the care and safety of which he is held responsible.

The department has 25 speed lathes for wood turning, 25 sets of bench tools, 96 sets of edge tools and as many locked drawers.

The blacksmith-shop is 40×45 feet, and is equipped with 25 forges, 25 anvils and 25 sets of anvil and forge tools.

The blast for the forges is supplied by a power blower, a 48" exhaust fan (donated by Huyett & Smith, of Detroit, Mich.); keeps the shops cool and free from smoke and gases even when all fires are going.

The machine-shops (40×45 feet) will be equipped during the summer with 13 engine screw-cutting lathes 14" swing, one 24" swing engine lathe, one 24" drill press, one 36" drill press, one 24"×24"×6' iron planer, one wet emery grinder, three speed lathes, one 15-inch shaper and bench-room for 12, thus furnishing ample accommodations for a class of 24 at a variety of machine tools.

Two large shops, each 40×45 feet, are as yet unfurnished, but will be equipped with benches and speed lathes and moulding outfit to suit the demands made upon the department in the future.

The drawing-room, 35×45 feet, is exceptionally well lighted from three sides, and is equipped with 32 adjustable drawing tables, furnishing accommodation for four classes of 32 each.

The interior is handsomely furnished.

This room is, perhaps, the best equipped, best lighted and furnished draughting-room in the Mississippi Valley.

The whole building is lighted by a 360-lamp dynamo, situated in engine-room.

No expense has been spared in equipping the shops and draughting-room; nothing but the best the market afforded was purchased; the point kept constantly in view was to equip a school the peer of any in the country, in order to give the students the best examples of workmanship for object lessons. The advantage of thus coming into contact with and using the best tools and machines is at once apparent.

The shop instruction is given by lectures. The instructor at the bench, machine or anvil fully explains the principles to be used or illustrated, and all work involving new principles is executed in the presence of the whole class, giving all the needed information, using drawings and the blackboard.

After every step has been explained the class proceeds to the execution of the work, while the instructor superintends and gives additional help to such as need it.

A series of 25 or 30 graduated exercises is given in each shop. All the shop-work is disciplinary; special trades are not taught, nor are articles manufactured for sale; the value lies in the educational feature of each exercise, that of training the mind and hand to act simultaneously, the one at the will of the other.

The department was organized in accordance with the Morrill act, which recognizes and seeks to foster a high appreciation of the value and dignity of intelligent labor and the worth and respectability of the laboring man.

COMMERCIAL COURSE.

The course of instruction in this School is not designed to take the place of a business college, but is organized with special reference to the wants of the farmer and artisan; it embraces a thorough and systematic course in penmanship, commercial arithmetic, and book-keeping. Students will be drilled in the use of the several account books, and common business forms, in folding and filing papers, and in conducting business correspondence—the object being to lay the foundation for correct business habits and methods, so much wanted by the majority of American farmers.

MILITARY SCIENCE.

An officer of the regular army is detailed by the War department as Professor of Military Science and Tactics, to carry out the provisions of the act of Congress of 1862, which, in endowing this and similar institutions, stipulates that military tactics shall be taught.

All students entering this department are required to conform to the rules and regulations prescribed for the Military Department, as contained in the subsequent pages of this Catalogue. The requirements of this department are so adjusted as to harmonize with the regular academic work of the students.

ENGLISH LANGUAGE AND LITERATURE.

The course embraces the study of language, of rhetoric and of literature, arranged as follows : First year, first semester, the Essentials of English; second semester, Rhetoric; second year, first semester, English Language; second semester, American Literature. Frequent exercises in writing and composition are required throughout. In the fourth year English is offered as an elective to any who may wish to pursue their studies in the language or literature.

MATHEMATICS.

Algebra (Smith's Elementary), three semesters, thrice weekly.

Plane Geometry (Smith's Modern), three semesters, twice weekly.

Plane Trigonometry (Smith's Clew) and *Surveying*, one semester, five times weekly.

Solid Geometry (Hayward's), one semester, thrice weekly.

See Department of Mathematics, p. 17.

CHEMISTRY.

Second year, *second semester* : Phenomenal Chemistry, 4 hours.

Third year, *first semester* : Applied Chemistry, 3 hours.

Third year, *second semester* : Agricultural Chemistry, 3 hours.

Fourth year, *first semester* : Chemical Laboratory, general chemical work and qualitative analysis.

Fourth year, *second semester* : Chemical Laboratory, Quantitative Chemical Analysis and Experiment Station work.

See Department of Chemistry, p. 23.

BIOLOGY.

First year, *first semester*: Elementary Zoology.

Second semester: Elementary Botany, three times a week.

Third year, *first semester*: Economic Entomology, three times a week. Applied Botany, three times a week.

See Department of Biology, page 27.

GEOLOGY AND MINERALOGY.

For full outline of the studies pursued, see Department of Geology and Mineralogy, page 24.

PHYSICS.

For course of study, text-books and facilities of instruction, see Department of Physics, page 20.

HISTORY AND POLITICAL ECONOMY.

For detailed information in regard to courses, etc., see Department of History and Political Economy, page 16.

COURSES OF INSTRUCTION.

The studies in the College of Agriculture and Mechanic Arts, as above outlined under the various departments, are arranged in the following courses:

I. A THREE MONTHS' WINTER COURSE.

To meet the wants of a class of young men who have not the time to go to college for a regular course of study, but who desire to secure a certain amount of practical instruction, bearing upon the work of the farm, and to aid them directly in its prosecution.

The instruction in this course will be given by means of lectures and practical illustrations; text-books will not be used except for reference.

This course will cover those specific fields of the science and art of agriculture, that will have a direct business value to farmers. Fundamental principles of science, in its relation to agriculture, will be so far presented as to reveal the laws upon which certain operations of agriculture rest, while at the same time a discussion of the world's best methods, as gained by experience, will be required—the equipment of the college, and its farm, affording some aid in the work.

There will be lectures by the teachers of Agriculture, by successful farmers, by the Professors of Horticulture, Veterinary Science, Chemistry, Botany, and by others.

This course will be given during the months of January, February and March. Students entering it must be at least sixteen years of age, and have a good common school education. No entrance examinations will be required, and an entrance fee of \$5 will cover all college expenses.

II. A TWO YEARS' COURSE.

This course is designed to take young men of fair average ability, not under sixteen years of age, and with such preparation as can be obtained in good district schools of the State, and give them a sound practical training that will broaden and strengthen them as citizens of the State, while it educates them in such branches of natural science as will cultivate their tastes for industrial pursuits and develop skill in their practice.

This course embraces the First and Second years of the regular Four Years' course, and those students who have not the opportunity of continuing their studies will find this an excellent preparation for practical life. The introduction of the industrial feature, by devoting two hours of each day to work on the farm, in the gardens, in the work-shop or in military drill, will keep up habits of industry, physical training, and that respect for labor which will tend to send the student back to the farm from choice, and not to educate him away from it.

III. A FOUR YEARS' COURSE.

This course is a two years' extension of the previous course, and is designed to give young men an advanced training in the higher departments of collegiate work, and to prepare them to enter upon their avocations in life as successful farmers, superintendents of farms, engineers, veterinary surgeons, botanists, entomologists, agricultural chemists, or lecturers.

Students completing this course will be entitled to the diploma of the University, conferring upon them the degree of B. Agr.

IV. A TWO YEARS' GRADUATE COURSE

Is designed to give a professional training in one or more of the schools of this College to graduates of the College, or of other colleges of the same character.

Young men completing this course and complying with the requirements for graduation will receive the degree of M. Agr.

I. FARMERS' LECTURE COURSE.

The lectures and exercises in this course will begin January 2, 1894, and will be continued daily, except Sunday and Monday, until March 22, 1894. Three lectures at least will be given each day, and the remaining time can be used by the student in work in the shops, laboratories, museums and libraries. Full details of the courses of lectures offered will be given in a separate circular, which will be issued in November, 1893, and sent to all applicants.

II. THE TWO YEARS' COURSE.

First Year.	
<i>First Semester.</i>	<i>Second Semester.</i>
Elements of Agriculture. 3	Elements of Agriculture. 3
Algebra and Geometry 5	Algebra and Geometry 5
English 3	English..... 3
Commercial Course. 3	Commercial Course..... 3
Elementary Zoology 3	Elementary Botany..... 3
Shop-work and Drawing 5	Shop-work and Drawing..... 5
Military Science (optional).	Military Science (optional).

Second Year.		Second Semester.	
First Semester.			
Horticulture	3	Agriculture	2
Algebra and Geometry.	5	Trigonometry and Surveying.....	5
English.....	5	Elementary Chemistry	4
Elementary Physics	3	Elementary Veterinary Science.....	3
Shop-work and Drawing.....	4	Shop-work and Drawing	5
Mineral Science (optional).		Military Science (optional).	

The above will constitute the "Two Years' course," and students completing it will be entitled to a certificate of the College, testifying to that fact.

This course is preparatory to the "Degree," or

III. THE FOUR YEARS' COURSE.

Third Year.		Second Semester.	
First Semester.			
Advanced Agriculture.....	3	Horticulture.....	3
Economic Entomology.....	3	Agric. Chemistry	3
Organic Chemistry.....	3	Advanced Physics	4
Mineralogy.....	4	Veterinary Science.....	3
Applied Botany.....	3	Elective	5
Chemical Laboratory.....	2		

Fourth Year.		Second Semester.	
First Semester.			
Forestry and Landscape Gardening.....	3	Geology	3
Physics.....	2	Veterinary Science.....	3
Farm Economy.	3	Experiment Station Work.....	3
Veterinary Science.....	3	Economics.....	3
History.....	2	Elective	6
Elective.	5		

Work done in the College of Agriculture and Mechanic Arts during the year 1892-3.

As this College was reorganized in September, 1891, only two classes have been admitted.

The following table exhibits the whole number of students in attendance, both *regular* and *special*, from September 13, 1892, to June 1, 1893, also the number in the several classes:

Class.	Regular....	Special.....	Total.
Agriculture	42	5	47
Horticulture	8	3	11
Mechanic Arts	38	58	96
Drawing.....	38	111	149
Mathematics	40	1	41
English Language	34	...	34
Civil Government.....	19	...	19
Commercial Course	30	109	139
Anatomy, Physiology and Hygiene.....	20	...	20
Veterinary Science	11	4	15
Military Science and Tactics	17	...	17
Number of students in all classes.....			630
Deduct all counted more than once.....			297
Total number of individual students.....			333

XVI. Normal Department.

 FACULTY.

RICHARD HENRY JESSE, LL. D.,
President.

JOSEPH PHILIP BLANTON, A. M.,
Professor of the Theory and Practice of Teaching.

PAUL SCHWEITZER, Ph. D.,
Professor of Chemistry.

JAMES SHANNON BLACKWELL, M. A., Ph. D.,
Professor of Semitic and Modern Languages.

JOHN CARLETON JONES, A. M., Ph. D.,
Professor of Latin Language and Literature.

EDWARD ARCHIBALD ALLEN, Litt. D.,
Professor of English Language and Literature.

WILLIAM BENJAMIN SMITH, A. M., Ph. D.,
Professor of Mathematics and Astronomy.

GEORGE DANA PURINTON, A. M., M. D., Ph. D.,
Professor of Biology and Curator of the Museum.

GARLAND CARR BROADHEAD, M. S.,
Professor of Geology and Mineralogy

MILLARD LEWIS LIPSCOMB, A. M.,
Professor of Physics.

WILLIAM GWATHMEY MANLY, M. A.,
Professor of Greek Language and Literature.

JOHN WALDO CONNAWAY, M. C. D., M. D.,
Professor of Physiology.

FREDERICK CHARLES HICKS, Ph. D.,
Professor of History and Political Economy.

CHRISTIAN WILLIAM MARX, B. E.,
Superintendent of Department of Mechanic Arts.

CHARLES BEMIS REARICK,
Assistant in Drawing and Mechanic Arts.

MELVILLE SINCLAIR KING, M. Acc'ts,
Instructor in Commercial School.

Professor of Elocution.

Professor of Philosophy (to be appointed soon).

COURSES OF INSTRUCTION.

There are two distinct courses, one Elementary and one Advanced.

The Elementary course extends over two years, and is intended to prepare teachers for the public schools of the State. Graduates in this course receive a State certificate, which entitles the holder to teach for a period of two years from the date of graduation.

ELEMENTARY COURSE.

	JUNIOR YEAR.	No. times per week.
<i>First Semester</i>	*Elocution	2
	English Language (third semester)	5
	Algebra and Plane Geometry (third semester)	5
	Physiology and Hygiene	3
	Elementary Zoology	3
	*Drawing	2
<i>Second Semester</i>	American Literature	2
	Physical Geography	5
	Elementary Botany	3
	Rhetoric	5
	SENIOR YEAR.	
<i>First Semester</i>	English History	2
	English Literature	3
	Elementary Physics	3
	Book-keeping and Penmanship	3
	+Pedagogics	5
	U. S. History	3
<i>Second Semester</i>	English Literature	3
	Chemistry	4
	Rhetoric	2
	Civil Government	3
	+Pedagogics	4

The Legislature at its last session having repealed the law requiring preparatory courses in the University, the subjects in the first year of the above courses will not be taught during the session of 1893-94, and the entire course, with the exception of the Pedagogics, will be abolished after that session.

All graduates of the approved High Schools and Academies (a list of which appears on page 35) who shall complete the course in Pedagogics prescribed above will be granted a certificate by the University, which authorizes them to teach in the public schools of Missouri for a period of two years. Students who take the course in Pedagogics, requiring five hours a week throughout the year, must take thirteen hours' additional work from the subjects prescribed for the Freshman year in any one of the three Academic courses found on page 31.

ADVANCED COURSE.

The following Courses two hours each per week in the Junior Year and three hours per week in the Senior Year, are prescribed to candidates for the degree of Bachelor of Pedagogics. Graduates of approved Colleges may, on satisfactorily completing these Courses, and on recommendation of the Faculty, receive this degree with a life certificate

*Elocution and drawing are required in all semesters, two hours a week, except the first semester of the Senior year.

†Pedagogics in the above course embraces the study of educational psychology, the history of educational theories and the organization and management of schools.

to teach in any public school in Missouri. The degree is also conferred upon regular graduates in any of the three Academic Courses (see page 31) who may elect during the Junior and Senior Years any four properly selected Courses in this department, aggregating five hours a week for two semesters or one year.

The following Courses are offered:

PREScribed.

1. *First semester, Junior Year:* History of Education. Lectures and Recitations. Texts: Compayre's History of Pedagogy, Quick's Educational Reformers.

2. *Second semester, Junior Year:* Theoretical and Critical. A consideration of the philosophic basis of education. Lectures and Recitations. Texts: Compayre's Lectures on Pedagogy, Rosmini's Method in Education.

3. *First semester, Senior Year:* Philosophy of Education. Text: Rosenkranz's Philosophy of Education, with an examination of Herbart's System.

4. *Second semester, Senior Year:* Application of the preceding principles to the various phases of actual instruction and school management. Lectures and Recitations. Texts: Compayre's Lectures on Teaching, Page on Teaching.

ELECTIVES.

5. *First semester, Junior Year:* School Systems of Europe. Lectures and Recitations. Text: Gill's Systems of Education, Klemm's European Schools.

6. *Second semester, Junior Year:* Philosophy of the Kindergarten. Lectures and Recitations; a thorough examination by the class of Froebel's Education of Man will be made.

7. *First semester, Senior Year:* A thorough examination of Herbert Spencer's Educational Theories.

8. *Second semester, Senior Year:* A comparative study of the school systems of the cities and states of the United States. Boone's Education in the United States will be read, and many of the circulars of information issued by the Bureau of Education will be available in pursuing this investigation.

The above Elective courses are each two hours per week in the Junior Year and three hours per week in the Senior.

9. *Teachers' Course:* Special courses of instruction are offered by professors in the University to teachers of the State free of all charges, beginning April 1, 1893, and continuing two months. The following course in Pedagogics is among this number:

I. Theoretical. A series of lectures and recitations on Educational Psychology.

II. Historical. A study of the history of Theories of Education that have prevailed in different ages and countries. A well-selected pedagogical library will be at the service of the teachers in doing this work, and their investigations will be directed by the professor in charge.

III. Practical. Instruction in the organization and management of schools. The value and object of Teachers' Institutes. The educational value of the various subjects in the common school curriculum. Can the time usually devoted to common school subjects be shortened and the pupil enter upon study of high school subjects at an earlier period? The public school system of Missouri. The school law, etc. The above topics will be discussed, and if time permit, others of a kindred nature.

Something of the above nature and scope will be offered in 1894, beginning April 1st, announcement of which will be made during the second semester by circulars to teachers. No fees are charged for any of these special courses.

XVII. Department of Law.

FACULTY.

RICHARD HENRY JESSE, LL. D.,
President of the University.

ALEXANDER MARTIN, A. M., LL. D.,
Dean of the Faculty and Professor of Law.

JAMES AULL YANTIS, LL. B.,
Professor of Law.

JOHN DAVIDSON LAWSON, B. C. L., LL. D.,
Professor of Law.

SPECIAL LECTURERS.

ANDREW WALKER MCALESTER, A. M., M. D., Dean of the Medical Department.
Lecturer on Medical Jurisprudence.

PAUL SCHWEITZER, Ph. D.,
Lecturer on Toxicology.

FREDERICK CHARLES HICKS, Ph. D.,
Lecturer on Theory of Jurisprudence.

HON. GEORGE B. MACFARLANE, Judge of the Supreme Court of Missouri,
Non-resident Lecturer on Criminal Law.

HON. ELMER B. ADAMS, Ex-Judge of Circuit Court of St. Louis,
Non-resident Lecturer on the Law of Wills and Administration.

HON. JAMES A. SEDDON, A. M., LL. B., Ex-Judge of Circuit Court of St. Louis,
Non-resident Lecturer on Commercial Law.

HON. UPTON M. YOUNG, of the St. Louis Bar,
Non-resident Lecturer on Equity Jurisprudence.

HISTORICAL STATEMENT.

The Law School was formally opened as a department of the University on the first Monday of October, 1872, since which time it has continued with uninterrupted progress and increasing success. Connected with its advancement in the past will be found the names of Judge Philemon Bliss, who, in his day, was a Judge of the Supreme Court of Missouri, and author of the well-known treatise on Code Pleading; Professor C. G. Tiedeman, author of numerous valuable treatises on different subjects of the law, written during his connection with the school; Hon. Boyle Gordon and Hon. Odon Guitar, eminent practitioners at the bar of Missouri.

ADVANTAGES.

The advantages now offered by the University of Missouri for instruction in the science and practice of common law, as prevailing in the United States, are not excelled in any university in the west.

Accommodations.—Since the destruction of the main University building by fire, January 9, 1892, the Curators have erected a large, commodious structure for the use of the Law Department. It contains a spacious library-room, two large lecture-rooms, moot court and club-rooms, quiz-rooms, along with offices for the professors. The department entered into possession of their new quarters February 21, 1893.

Lectures and recitations begin in both lecture-rooms at 9 o'clock a. m., and close at 1 o'clock p. m. daily. Moot courts are held in the lecture-rooms or library-room every Thursday at 3 o'clock p. m. Lectures and recitations are held in the afternoon when necessary to meet the requirements of the department.

Libraries.—The library of the Law Department consists at present of a large collection of reports, and treatises on every subject of the law. It is increasing rapidly every year. All the decisions of the American courts are received at the library as soon as published. A complete set of digests of decisions and reports is kept up, so that the latest expressions of authority are brought within reach of the students and professors. Members of the Law Department have access to the general library of the University. The Law library was mostly saved from loss by the fire, and has been restored and increased during the past year.

Academic Facilities.—The connection of the Law Department with the University enables the law student to pursue any branch of instruction in the Academic Department which does not interfere with his legal studies, without additional charge. Some of the members of every class have found it convenient to pursue studies in the Academic Department, such as Latin, French, Logic, Rhetoric, Military Science, Political Economy and History, etc.

University Societies.—Members of the Law Department are eligible to membership in the two great literary societies of long standing in the University known as the "Athenæan" and "Union Literary." They are also eligible to membership in the "Bliss Lyceum," a society founded in connection with the Law Department, and to which members of that department alone are admitted.

These societies in the University are its nurseries of oratory, debate and parliamentary law.

METHODS OF INSTRUCTION.

LECTURES, RECITATIONS, EXAMINATIONS AND STUDY OF TREATISES AND CASES.

The first benefit inuring to the student who enters a good law school is to learn how to study law, as distinguished from merely reading it.

A student in an attorney's office is too apt to continue, in his study of law, the superficial habit acquired by him in the perusal of newspapers, literary periodicals and novels.

On entering the school he is instructed in the proper method of reading treatises and reports of cases; of examining questions of law, taking notes of lectures, and of handling digests, dictionaries and compilations of the law.

The Law Faculty is satisfied from experience that the highest results cannot be reached by lectures alone, however clear and thorough they may be; but that the students, as far as possible, should be required to study the text of some approved treatise on the subject of instruction, and to examine critically well-considered cases illustrating the principles discussed in the lecture-room. For the purpose of ascertaining the progress of the student, and impressing upon him the necessity and advantages of precise and definite knowledge of the subject upon which he has received instruction, he should be required

to stand frequent recitations and examinations on the work accomplished by him. He should also be required to take notes of the substance of the lectures, and of the cases furnished by the professor for his investigation. In this manner, it is believed, he will receive the full advantages of the lecture and recitation methods of instruction as applied to the study of treatises and the examination and analysis of cases. A combination of these methods has, in the opinion of the Faculty, produced the most satisfactory results.

MOOT COURT.

A Moot Court is held every Thursday, in which members from all the classes participate. In this court the matters discussed arise in some supposed cause. Regular pleadings are required, and when the cause is supposed to be in the Supreme Court, in addition to the pleadings, papers are prepared, necessary in actual practice, as the writ of errors, assignment of errors, bill of exceptions embodying the instructions to the jury, ruling upon the admission or exclusion of evidence, motions for new trial or in arrest, etc. Briefs of points and authorities must also be submitted and filed. A member of the Faculty presides at the trial, determining all preliminary and incidental motions. A member of the Senior class or Graduate class is called to sit as special judge in each cause, who, the next week, gives his opinion in writing, subject to appeal to the member of the Faculty present at the trial.

COURSES OF STUDY.

The principal object of the courses of study adopted in the school is to qualify its graduates for an efficient and successful discharge of their duties as licensed attorneys. It has never been within the aim of the school to cram its students for the purpose of qualifying them to pass the special examinations which may possibly take place at the bars to which they may seek admission. The courses of study have been adopted with the view of familiarizing the successful candidate for a degree with the principles of substantive law, and the law of remedy and procedure, as prevailing in American jurisprudence. After a short study of the statutes and decisions of the State in which he expects to settle, he will deserve admission to the bar. As the degree of LL. B. from this school entitles the graduate to admission to the bar of the State of Missouri, the Faculty cannot overlook the fact that a fair knowledge of the general statutes of the State, and of the modifications which the common law has undergone in the decisions of the courts, is an essential qualification for admission to its bar. But, as there is great similarity in the general statute and judiciary law of the Western, Northwestern and Southwestern states, it is believed that what may be learned in that respect will be of benefit to a student settling in any of said states.

UNDER-GRADUATE COURSE.

The full under-graduate course is for a term of two years. The students in it constitute two classes—Juniors and Seniors. Instruction is given daily to these classes, in the form of lectures, recitations and examinations upon the text-books recommended and leading cases furnished by the Faculty. Every Thursday they participate in the exercises of a Moot Court.

The Junior class will receive instruction on the following subjects:

Elementary Law, Law of Torts:

By Professor YANTIS.

Contracts, Personal Property, Bailments, Sales, Domestic Relations, Criminal Law:

By Professor LAWSON and Special Lecturers.

Negotiable Instruments:

By the DEAN and Special Lecturers.

The Senior class will receive instruction on the following subjects:

Real Property, Evidence, Corporations:

By Professor YANTIS and Special Lecturers.

Equity Jurisprudence, Pleading and Practice, Admiralty and Maritime Law, Constitutional Law, International Law:

By the DEAN and Special Lecturers.

Agency, Partnership, Insurance:

By Professor LAWSON.

Law of Wills and Administration:

By Special Lecturers.

Theory of Jurisprudence:

By Professor HICKS.

TEXT-BOOKS.

The text-books recommended are as follows:

For the Junior year—

Robinson's Elementary Law in connection with Blackstone.

Lawson on Contracts.

Browne on Domestic Relations.

Bigelow on Torts.

Tiedeman on Sales.

Bigelow on Notes and Bills.

Schouler on Bailments.

Darlington on Personal Property.

Lawson's Leading Cases in Criminal Law.

For the Senior year—

Bispham's Principles of Equity.

Tiedeman on Real Property.

Bliss on Code Pleading.

Greenleaf on Evidence (1st vol.).

Taylor on Corporations.

Richards on Insurance.

Pollock on Partnership.

Mecham on Agency.

Werner on Administration.

Cooley's Principles of Constitutional Law.

Woolsey's International Law.

Desty on Shipping and Admiralty.

Desty's Federal Procedure.

GRADUATE COURSE.

This course is open to graduates of the two years' course in the Law Department, and to graduates from other law schools who have completed a similar or equivalent course.

The object of this course is to provide the future practitioner with a more extended and practical knowledge of the most important subjects embraced in modern law, than the limited time of the under-graduate course will admit of. It is also intended to afford him assistance in prosecuting the study of any particular subject or branch of law which he expects to follow in his future practice.

The course of instruction will embrace lectures and recitations on the following subjects:

Constitutional Law.

Corporations.

Trusts.

Patents.

Copyrights.

Law of Homicide.

Theory of Jurisprudence.

The student in this course will be allowed to select any special subject in law for extended examination and study, to be prosecuted concurrently with the subjects embraced in the course. His examination and study will be directed by the Faculty, who will advise him of the books and cases to consult, and afford him assistance and counsel when called upon.

It is believed that many licensed attorneys, beginning or about to begin practice, will find it to their advantage to take the instruction in this course as special students.

The text-books recommended for the Graduate course are as follows:

Lawson on Usages and Customs.

Cooley on Constitutional Limitations.

Miller on the Constitution of the United States.

Lewin on Trusts.

May on Insurance.

Walker on Patents.

Bishop on Criminal Law.

Morwitz on Corporations.

Holland's Jurisprudence.

SPECIAL COURSES.

The students who do not wish to take any of the full courses, and who are not candidates for any of the degrees awarded to those who have successfully completed said courses, will be permitted to take an elective course, and pursue any branches of study and instruction given in the department, the exercises of which do not conflict with each other. They will be classed as special students, and will receive certificates from the Faculty of the time spent at the school, and the work accomplished by them. Those desiring to become special students are required to advise with the Faculty before fixing upon the special studies which they expect to pursue.

QUALIFICATIONS FOR ADMISSION.

UNDER-GRADUATE COURSE.

Junior Class.—For admission to the Junior class, no examination in law is imposed. In respect to academical education, candidates are advised to complete, if they can, a full academic or collegiate course. A good common-school education at least must be possessed by the candidate. The Faculty must be satisfied of this by certificates to that effect from instructors in the public schools, or by examination of the candidates conducted by themselves, or by professors in the English department of the University. If unknown to the Faculty, the candidate must bring satisfactory testimonials of good character.

Candidates will be admitted to the Junior class at any time during the Junior year, upon passing an examination upon the work accomplished by the class at the date of the examination.

Senior Class.—No one will be admitted to the Senior class as a candidate for a degree unless he applies at the beginning of the year, and has sustained, or is able to sustain, an examination upon the studies of the Junior year. In exceptional cases, upon failure in one or two branches only, the examination, as to those branches, may be postponed to some period during the term, and the applicant will be admitted to the class as a candidate for a degree, upon the condition of sustaining a satisfactory examination on those branches at the time appointed for it.

GRADUATE COURSE.

Graduate Class.—No one will be admitted to this class as a candidate for the degree of LL. M., unless he holds the degree of LL. B. from the Law Department of this University, or is a graduate of some other law school, whose course of instruction and study, upon which his degree is predicated, is equivalent to the course of instruction and study required for the corresponding degree in the Law Department of this University.

No admission to the Senior or Graduate class will be permitted after two weeks from the commencement of the year.

SPECIAL COURSE.

The same qualifications as to a common-school education and character, required of candidates for the Junior class, will be exacted of students admitted to pursue special courses selected by them.

DEGREES AND HONORS.

Members of the Senior class, who have successfully passed the examinations of the Senior year, will be entitled to receive from the Board of Curators the degree of Bachelor of Laws. Members of the graduate class who have successfully passed the examinations belonging to the graduate course will be entitled to receive the degree of Master of Laws.

Whenever a candidate for graduation attains a high degree of excellence in his class work, the degree of Bachelor of Laws or or Master of Laws will be conferred upon him with distinction, and the words *cum laude* will be incorporated in the diploma. In determining the required degree of excellence, the student's conduct as a gentleman, as well as his attainments as a scholar, will be taken into consideration.

Only those Seniors who shall have attained first rank with distinction shall be eligible to the honor of valedictorian at Commencement.

The members of the Senior class are all invited to write essays upon some subject in law, assigned to them by the Faculty, before January 1 of each year. The essays so written will be submitted to a committee of judges charged with the duty of designating the best two of said essays. The best one of the two thus designated will be read by the author at Commencement exercises, and both of them will be recommended for publication. Students not writing essays as aforesaid shall not be eligible to any of the honors and distinctions heretofore mentioned as in addition to the right of graduation, unless they have been excused therefrom for good cause.

A prize of fifty dollars, provided in the endowment fund of the late Hon. James S. Rollins, is awarded each year to the member of the Junior Law class who has shown himself entitled thereto by his superior scholarship and moral conduct.

The prize will be awarded at the Commencement following the close of the Junior year.

All who receive the degree of Bachelor of Laws are by law admitted, without further examination, to practice in all the courts of the State of Missouri.

ATTENDANCE.

The attendance in the Law department for the year ending June 1, 1893, numbered 57. For list of students attending during the year, see "Students," in the Index.

DISCIPLINE.

The Faculty requires every student to pay strict attention to the duties assumed by him, and to be honorable and considerate in his intercourse with the Faculty, his fellow students and citizens. This is the only rule of behavior, the highest penalty for violation of which is expulsion.

OPENING AND CLOSING.

The Law department opens on the second Tuesday in September, and closes on the first Thursday in June of each year. The present year ends June 1, 1893. The year next succeeding the present one will open Tuesday, September 12, 1893.

EXAMINATIONS FOR ADMISSION.

Examinations for admission will be held in the lecture-rooms on the second Tuesday in September, at 11 o'clock a. m., and at the same hour on the first day of collegiate exercises after the first day of January.

Examinations for admission will be accorded at other times upon request to suit the convenience of applicants.

TUITION CHARGES AND EXPENSES.

For information as to the tuition charges and expenses of the Law department, see "Fees and Expenses."

For information and catalogues, address

ALEXANDER MARTIN, Dean,
Columbia, Mo.

XVIII. Department of Medicine.

FACULTY.

RICHARD HENRY JESSE, LL. D.,
President of University.

ANDREW WALKER McALESTER, A. M., M. D., Dean of Faculty,
Professor of Surgery and Obstetrics.

PAUL SCHWEITZER, Ph. D.,
Professor of Chemistry and Toxicology.

WOODSON MOSS, M. D.,
Professor of Practice of Medicine and Anatomy.

GEORGE DANA PURINTON, A. M., M. D., Ph. D.,
Professor of Medical Botany.

MILLARD LEWIS LIPSCOMB, A. M.,
Professor of Physics.

JOHN WALDO CONNAWAY, M. D. C., M. D.,
Professor of Physiology (Human and Comparative).

†PAUL EVANS, M. D.,
Professor of Histology and Bacteriology.

SPECIAL LECTURERS.

PAUL PAQUIN, M. D.,
Lecturer on Bacteriology.

A. B. MILLER, A. M., M. D.,
Lecturer on Gynecology.

G. E. HIGHSMITH, M. D.,
Lecturer on Abdominal Surgery.

M. D. LEWIS, M. D.,
Lecturer on Practice of Medicine.

J. L. CORLEW, M. D.,
Lecturer on Obstetrics.

F. P. HULEN, M. D.,
Lecturer on Diseases of Women and Children.

W. A. NORRIS, M. D.,
Assistant Demonstrator of Anatomy.

†Resigned.

REQUIREMENTS FOR ADMISSION.

The requirements for admission shall be the same as in the Academic departments.

Students are strongly urged to take degrees in Art or Science before entering this department.

COURSE OF INSTRUCTION.

First Year—Anatomy (osteology and dissecting), Physiology (chemical, nutritive and reproductive), Chemistry, Physics, Normal Histology, Microscopy, with mounting and staining normal tissues; General Therapeutics.

Second Year—Anatomy, general and descriptive, and dissections; Physiology, Nervous System, Chemistry, Microscopy, mounting and staining bacteria; Therapeutics Theory and Practice of Medicine, Surgery and Obstetrics.

Third Year—Theory and Practice of Medicine, Clinical Medicine, Physical Diagnosis, Surgery, Clinical Surgery; Anatomy, surgical and topographical: Obstetrics, Therapeutics, Gynecology, Diseases of Children; Diseases of eye, ear, nose and throat; Sanitary Science; Medical Jurisprudence; Work in Bacteriological Laboratory.

PLAN OF INSTRUCTION.

Instruction is given by lectures, recitations, clinical teaching and laboratory work.

The length of the session, nine months, renders it practicable to distribute the different branches among the teachers in the most satisfactory manner, and in their natural order and succession. The student is thoroughly drilled each day by examinations upon the lectures of the previous day, and by recitations from text-books.

By this method of teaching, it is claimed that we avoid the process of cramming—a deleterious practice, too prevalent in the general system of medical education. We believe that the proposed method of teaching will do more to elevate the standard of medical education, and to exalt the dignity of profession, than any other measure that could be adopted.

Besides the ordinary instruction in chemistry, a special course is given to advanced students in Toxicology, the material and appliances for teaching which are not excelled by any institution in the United States.

The students are also taught the use of the microscope, in relation to both pathological and physiological studies. The methods of bacteriological investigation are taught by practical work in the laboratory. Besides the microscope, the department has the benefit of two superior magic lanterns. For illustrating lectures with the above instruments, there are over 500 slides.

Among the advantages offered by this school is the privilege granted without further cost to all students who enter the Medical department, of pursuing such studies as they may desire in the academic course. Academic students may take Anatomy and Physiology in the medical course, preparatory to entering on the full medical course after graduating in Art or Science. Such students are admitted to the Second year's medical class.

This department is equipped with models in plastic and papier mache, plaster casts, drawings and other appliances for the illustration of the lectures on anatomy, surgery and physiology.

Among the many valuable preparations for demonstrating anatomy and surgery is Dr. Auzoux's Plastic man, a complete and accurate model of the male human body. The figure is five feet ten inches in height, and is composed of ninety-two separate parts, which may be detached from one another. It exhibits over two thousand details of the viscera, muscles, nerves, blood-vessels, etc., in short, all that is usually embraced in a complete treatise on anatomy.

Also, Auzoux's female pelvis, with the external organs of generation, the lumbar vertebrae, diaphragm, muscles, aponeuroses of the perineum, vessels and nerves.

Also, his collection illustrating Ovology. These models are on an enlarged scale, and exhibit the modification of the ovum, envelopes and vitelline vesicle, etc.

In addition to the above are eight uteri, in plastic, containing the products of conception at the first, second, third, fourth, eighth and ninth months, with examples of tubular and ovarian pregnancy.

Another model, to which we deem it proper to call attention, is Dr. Auzoux's synthetic model of the brain, which exhibits the structure of that organ upon an immensely magnified scale. Designed in conformity with the new anatomical indications furnished by Dr. Luys, this model presents a resume of all the researches of ancient and modern anatomists. This entirely new method of studying the brain opens an immense field for the research of physicians and philosophers. The models of the eye and ear are greatly enlarged and very accurate, showing the complete gross structure of these organs, as described by modern anatomists. The preparation of the head is most admirably executed. The bones are disarticulated and mounted according to the method of Beauchene.

Besides these invaluable models and preparations, we have a complete set of the German anatomical models, in plastic, made at Leipzig.

PRACTICAL ANATOMY.

Every facility is afforded the student for the study of practical anatomy. Adequate provision is made for a supply of subjects amply sufficient for the number of students. The dissecting rooms are large and well ventilated, and will be open during the whole winter season, where, under the guidance of the demonstrators, the student may, by dissection, acquire a practical knowledge of the human body in all parts.

CLINICS.

The number and variety of Medical and Surgical Clinics are ample for purposes of clinical instruction.

DEGREES.

Upon a satisfactory completion of the above course, the degree of Doctor of Medicine will be conferred.

In addition to the ordinary degree of M. D., we recommend the degree of "*M. D. cum laude*" to all students having the degree of A. B. or S. B.

EXAMINATIONS.

Students must pass in the work of each class before admission to an advanced class. For information in regard to tuition charges, fees, etc., see "*Fees and Expenses.*"

REQUIREMENTS FOR GRADUATION.

1. The candidate must have completed the course prescribed and passed a satisfactory examination thereon.
2. He must be twenty-one years of age, and must exhibit to the Faculty satisfactory evidence of possessing a good character.
3. His last course of lectures must have been attended in this department.
4. He must have been regular in attendance on lectures and recitations.
5. He must have pursued the study of practical anatomy, under the supervision of the demonstrator, during his pupilage in this department.
6. He must notify the Dean of the Faculty before the 8th of April of his intention to become a candidate for graduation at the ensuing Commencement.
7. Every candidate must appear before the members of the Faculty for examination in the various branches of medicine taught in this department at the time appointed for such examinations.

8. Conformity to the general laws and rules established by the Curators and the Faculty for the government of the University, discharge of duties, regular attendance upon lectures and in laboratories are required of all students.

9. If a candidate is rejected, his diploma fee will be returned to him.

For flagrant violation of the rules and laws established for the government of the University, a professional student may be expelled from the Institution. In such a case the fees on his entrance will not be returned to him.

TEXT-BOOKS AND BOOKS OF REFERENCE.

Anatomy—*Gray*, Wilson, Leidy.

Surgery—*Ashurst*, Gross, Erichsen.

Physiology—*Dalton*, Flint, Foster, Kirke.

Principles and Practice of Medicine—*Flint*, Niemeyer, Watson.

Materia Medica—*Bartholow*, Biddle, Farquharson.

Chemistry—

Obstetrics—*Playfair*, Lusk.

Diseases of Women and Children—*Thomas*, Smith.

Histology—*Prudden's* Normal, Rindfleisch's Pathological Histology.

Pathology—*Ziegler*, Paget, Gross.

Toxicology—*Taylor*.

Ophthalmology—*Wells*, Williams.

Otology—*Toynbee*, Turnbull.

Medical Jurisprudence—*Taylor*, *Tidy*.

Nervous Diseases—*Ranney*, Hammond, Reynolds.

Diseases of the Heart and Lungs—*Flint*, Loomis.

Every student should provide himself with a medical dictionary (*Dunglison's* is suggested). The text-books are designated by *italics*.

All works used as text-books in the school, as well as books of reference, can be purchased here on as favorable terms as in any of the eastern cities.

For any further information in relation to the school, address

A. W. MCALESTER, M. D.,

For catalogues, address

Dean of Medical Faculty, Columbia, Mo.

WOODSON MOSS, M. D.,

Secretary Medical Faculty, Columbia, Mo.

XIX. Department of Engineering.

FACULTY.

- RICHARD HENRY JESSE, LL. D.,
President of the University.
- RICHARD HADEN HOOD, C. E.,
Professor of Civil Engineering.
- WILLIAM SHRADER, B. S., Ph. D.,
Professor of Electrical Engineering and Assistant Professor of Physics.
- CHRISTIAN WILLIAM MARX, B. E.,
Professor of Mechanical Engineering and Superintendent of Mechanic Arts.
- †ALEXANDER MAITLAND, C. E.,
Assistant Professor of Civil Engineering.
- JAMES SHANNON BLACKWELL, M. A., Ph. D.,
Professor of Semitic and Modern Languages.
- PAUL SCHWEITZER, Ph. D.,
Professor of Chemistry.
- EDWARD ARCHIBALD ALLEN, Litt. D.,
Professor of English Language and Literature.
- WILLIAM BENJAMIN SMITH, A. M., Ph. D.,
Professor of Mathematics and Astronomy.
- GEORGE DANA PURINTON, A. M., M. D., Ph. D.,
Professor of Economic Botany and Curator of the Museum.
- GARLAND CARR BROADHEAD, M. S.,
Professor of Geology and Mineralogy.
- MILLARD LEWIS LIPSCOMB, A. M.,
Professor of Physics.
- MILTON UPDEGRAFF, M. S., B. C. E.,
Assistant Professor of Mathematics and Astronomy, and Director of the Observatory.
- CHARLES BEMIS REARICK,
Assistant in Drawing and Mechanic Arts.
- SAMUEL A. SMOKE (Lieutenant U. S. Army),
Professor of Military Science and Tactics.
- HOWELL VAN BLARCOM,
Assistant in Mechanic Arts.

†Resigned.

ENGINEERING COURSES.

Three courses are offered, Civil, Electrical and Mechanical Engineering, which lead to the degrees of C. E., E. E. and Mech. E.

The first year is the same for all these courses.

Requirements for Admission to the Freshman Year: Arithmetic, Plane Geometry, Algebra (first 18 chapters of Smith's Treatise, or its equivalent by other authors), English Grammar and Composition, Geography and United States History.

1. CIVIL ENGINEERING.

R. H. HOOD, Professor.

COURSE IN CIVIL ENGINEERING.

Freshman Year.

<i>First Semester.</i>		<i>Second Semester.</i>	
Solid Geometry and Algebra.....	5	Trigonometry and Algebra	5
English	3	English	2
French or German.	3	French or German	3
(1) Drawing and Projections	5	(2) Drawing	3
Shop, Wood-work.....	2	Chemistry	4
		Shop, Wood-work	2
		Summer Thesis.	

Sophomore Year.

<i>First Semester.</i>		<i>Second Semester.</i>	
(3) Descriptive Geometry.....	5	Physics	4
(5) Drawing	2	(4) Drawing	3
(7) Chain and Compass Surveying.....	4	Chemistry	3
English	3	Analytic Geometry.....	4
Analytic Geometry.....	3	Botany.....	2
Shop, Patterns and Turning	2	Shop, Blacksmithing, Filing, etc	2
		Summer Thesis.	

Junior Year.

<i>First Semester.</i>		<i>Second Semester.</i>	
Differential and Integral Calculus.....	6	(6) Applied Mechanics.....	5
Spherical and Practical Astronomy.....	3	(8) Surveying and Geodesy.....	5
Physics—Heat	2	Thermo-dynamics	2
Mineralogy and Lithology.....	4	Geology.....	3
(9) Machine Design and Construction.....	3	Electricity and Magnetism.	4
		Summer Thesis.	

Senior Year.

First Semester.

(11) Applied Mechanics	5
(13) Hydraulics and Hydr. Motors	3
(15) Strength of Materials	3
(17) Steam Engine	3
(19) Inspection of Eng'r Materials	1
Physical Experiments	1
Metallurgy of Iron and Steel.	2

Second Semester.

(10) Stone Cutting, Theory	2
(12) Stone Cutting, Plates	2
(14) Railroads, Roads and Canals	5
(16) Bridges, Roofs, Structures, etc.	5
(18) Specifications and Contracts	1
(20) City and Sanitary Engineering	2

Graduation Thesis.

The figures in parenthesis refer to the synopsis found below—odd numbers for first semester and even for second semester subjects.

SYNOPSIS OF CIVIL ENGINEERING SUBJECTS.

First Semester—

1. Drawing, 5 times per week. Text: 'Mahan's Industrial Drawing revised by Thompson. Free-hand Drawing and Sketching, Lettering and Round Writing, Elements of Draughting and Tinting.

Projections—Theory and Plates.

3. Descriptive Geometry. Text: Church's Descriptive Geometry, 5 times per week. Descriptive Geometry, Shades and Shadows, Perspective, Spherical and Isometric Projections.

5. Drawing, 2 times per week. Plates for Course 3.

7. Surveying, 4 times per week. Text: Gillespie's Surveying, Staley. Chain and Compass Surveying, Use of Solar Compass, Farm Surveying, Field Work and Mapping. Available for the students taking the "40 weeks in Surveying."

9. Machine Construction and Drawing, 3 times per week. Text: 'Warren's Machine Construction. Elements of Machine Construction, Bearings, Journals, Shafting, Pulleys, Belts, Gearing, Odontograph, Screw Propeller, Slide Valves with Connections and Functions, Governors.

11. Applied Mechanics, 5 times per week. Text: Rankine's Applied Mechanics, Burr's Bridges and Burr's Materials of Engineering. Notes. Theory of Structures, Masonry and Earth Dams. Arch, Pier and Abutment. Graphical Statics. Masonry Construction.

13. Hydraulics and Hydraulic Motors, 3 times per week. Text: Merriman's Hydraulics. Theoretical Hydraulics; Flow of Fluids through Orifices, Tubes, Pipes, Conduits, Canals, Weirs, etc. Flow of Rivers; Weir Measurements, Measurement of Water Power. Hydraulic Motors, Overshot, Breast, Undershot and Reaction Wheels, Turbines, etc.

15. Strength of Materials, 3 times per week. Text: Burr's Materials of Engineering and Merriman's Mechanics of Materials. General Theory of Elasticity; Theory of Flexure; Tension, Compression, Long Columns, Shearing and Torsion; Deflections; Working Stresses and Factors of Safety. Fatigue of Metals and Flow of Solids.

17. Steam Engine, 3 times per week. Text: Green's Notes on the Steam Engine. Theory of the Steam Engine. Heat, Combustion, Proportions of Boilers and Chimneys, Properties of Water and Steam, Early Types of the Steam Engine, Jet and Surface Condensation, Work Performed in the Cylinder, Compound Engine, the Indicator, General Dimensions of Engines, Marine Engines, Screw Propeller, Design of a Pumping Plant, Valves and Valve Motions.

19. Inspection of the Common Materials of Engineering, once per week. Text: Notes. Iron, Steel, Wood, Brick, Cement, Lime, Sand, Stone, etc. Specifications.

Second Semester—

2. Drawing, 3 times per week. Continuation of Course 1, also Working Drawings for Machines and Structures.

4. Drawing, 3 times per week. Mapping, Pen and Colored Topography, Detailed Shop Drawings for Bridge Work.

6. Applied Mechanics, 5 times per week. Text: Rankine's Applied Mechanics. Principles of Statics, Kinematics and Dynamics.

8. Higher Surveying and Geodesy, 5 times per week. Text: Johnson's Theory and Practice of Surveying. Theory and Use of Instruments; Transit and Level; Hydrographical Surveying; Topographical Surveying; Geodetic Surveying; Field work and Mapping. Available for the students taking the "40 weeks in Surveying."

10. Stone-cutting, 2 times per week. Text: Warren's Stone-cutting. Arches, Piers, Abutments, Wing-Walls, Oblique and Groined Arches, Winding Stairs, Conoidal Wing-Walls, etc.

12. Stone-cutting, 2 times per week. Plates for Course 10.

14. Railroads, Roads and Canals, 5 times per week. Text: Searle's Field Engineer, Byrne's Highway Construction. Notes.

Railroad Location and Construction. General Theory of Economics. Maintenance of Way. Operation of Railroads. Trunk Lines of the United States. Canal Construction. Roads, Streets and Pavements. Cable and Electric Street Railways.

16. Bridges, Roofs and Framed Structures, 5 times per week. Text: Burr's Bridges, Roofs and Arches. Notes.

Roof Trusses and Mill Construction. Railroad and Highway Bridges—Trusses, Swing Bridges, Arched Ribs, Suspension and Cantilever Bridges. Details of Construction. Modern Shop Practice. Methods of Erection.

18. General Specifications and Contracts, once per week. Text: Haupt's Manual of Engineering Specifications and Contracts. Drawings, Estimates, Specifications, Advertisements, Proposals and Contracts.

20. City and Sanitary Engineering, 2 times per week. Text: Staley and Pierson's Separate System of Sewerage. Notes. Sewers and Sewerage. Water Supplies. Municipal Engineering. City surveying. Pumping Machinery. Pavements.

A special Course in Surveying is offered in addition to the regular four-years' C. E. Course. This is designed especially for those wishing to fit themselves for the position of county Surveyor or government land Surveyor. A certificate of proficiency is given to those that complete this Course, which may be done in 40 weeks.

The fact that we have been able to secure positions (on the surveys and improvements of the Mississippi and Missouri rivers, on the Coast Survey, on railroad surveying and engineering parties, on bridge engineering and on government land surveying parties) for the graduates from this department, has materially assisted in awakening an intelligent interest—a healthy enthusiasm—in the cause of engineering education at this University.

For tuition and other expenses, see "Fees and Expenses."

See also "James S. Rollins University Scholarships," section 6. Examinations for admission will be held the first week of each semester. Certificates from the approved schools will be accepted in place of an examination.

Address for further information,

R. H. Hood,

• Professor of Civil Engineering.

2. ELECTRICAL ENGINEERING.

WILLIAM SHRADER, Professor.

On account of the rapidly growing importance of Electrical Engineering, there has been especial attention paid to the equipment of this department. The instruments are mostly of new forms and of the finest make.

Among these may be mentioned Ayrton and Perry's Secohmmeter and Standard of Self Induction; Ayrton and Perry's Ammeters and Voltmeters; Hot-wire Voltmeter; Magnetic Vane Ammeter; Portable D'Arsonval Galvanometer; Ballistic Galvanometer; Standard Tangent Galvanometer; Sir Wm. Thomson's Reflecting Astatic Galvanometers; Wiedemann's Dead Beat Galvanometer; Standard resistance boxes and Wheatstone Bridges; Queen's new Portable Testing and Resistance Set; Kohlrausch-Kirchhoff Wheatstone Bridge; Electro-dynamometers; Sir Wm. Thomson's Direct Reading Balances and Graded Potential Galvanometer; Voltmeters, Electrometers and Magnetometers.

Among several important appliances are the following: A complete electric light plant consisting of a 60-horse power Corliss engine, a number of dynamos and motors of various sizes and types, series, shunt and compound wound, and in connection with these for use in experiments, Brackett's Cradle Dynamometer with registering apparatus, portable tachometers, speed counters and measuring instruments of most approved forms, a model lighting plant with switch-board and station instruments complete, a large electro-magnet with laminated cores and adjustable pole pieces for the study of resistance and leakage, magnetic induction, etc

The work in the Electrical Engineering Laboratory consists in the measurement of resistances, electromotive forces and commercial currents by various methods and instruments; the calibration of instruments; especial attention is paid to the study of dynamos and motors, the determination of their electrical and commercial efficiencies, the determination of the candle power of arc and incandescent lights, etc Practice is had in the designing and construction of electrical apparatus and machinery, and in laying out installations.

COURSE IN ELECTRICAL ENGINEERING.

Freshman Year.

Solid Geometry and Algebra	5	Trigonometry and Algebra.....	5
English	3	English.....	2
French or German	3	French or German.....	3
Drawing and Projections	5	Drawing.....	3
Shop, Wood-work	2	Chemistry.....	4
		Shop, Wood-work	2

Sophomore Year.

Descriptive Geometry.....	5	Physics.....	4
Drawing	2	Drawing.....	3
Analytic Geometry.....	3	Analytic Geometry.....	4
French or German	3	Chemistry	3
English.....	3	French or German	3
Shop, Iron-work	2	Shop, Iron-work	2

Junior Year.

Calculus, Differential and Integral.....	6	Mechanics.....	5
Physics.....	4	Electricity and Magnetism	3
Shop.....	5	Thermo-dynamics	2
French or German.....	3	French or German	3
		Optics and Physical Laboratory	4
		Shop.....	2

Senior Year.

Applied Mechanics.....	5	Technical Applications of Electricity ..	6
Dynamo-Electrical Machinery.....	4	Dynamo-Electrical Machinery	4
Steam Engine	3	Calibration of Instr. and Elec. Testing.	2
Electrical and Magnetic Measurements..	3	Machine Design	3
Physical Laboratory.....	2	Specifications and Contracts.....	1
Chemical Laboratory	2	Thesis.....	2

For the benefit of students who are unable to pursue their studies long enough to complete the regular course in Electrical Engineering, there is a special course of two years, ending with certificate.

SPECIAL COURSE IN ELECTRICAL ENGINEERING.

Freshman Year.

<i>First Semester.</i>		<i>Second Semester.</i>	
Chemistry.....	4	Chemistry.....	4
Composition and Rhetoric.....	2	Composition and Rhetoric	2
Geometry, Trigonometry and Algebra..	5	Geometry, Trigonometry and Algebra..	5
Drawing	2	Drawing.....	2
Shop.....	2	Shop.....	2
Electro-dynamics.....	4	Physics (from Sophomore)	4

Sophomore Year.

<i>First Semester.</i>		<i>Second Semester.</i>	
Physics (Junior).....	3	Technical Application of Electricity....	3
Drawing	3	Steam Engine.....	2
Shop	5	Machine Design	2
Physical Laboratory	2	Drawing.....	2
Electrical Laboratory	2	Shop	3
Arithmetic of Electrical Measurements.	4	Chemical Laboratory (Junior)	3
		Electrical Laboratory.....	4

3. MECHANICAL ENGINEERING.

C. W. MARX, Professor.

Freshman Year.

Solid Geometry and Algebra.....	5	Trigonometry and Algebra	5
English	3	English	2
French or German.....	3	French or German.....	3
Drawing and Projections.....	5	Drawing	3
Shop, Wood-work.....	2	Chemistry.....	4
		Shop, Wood-work.....	2

Sophomore Year.

Descriptive Geometry	5	Physics	4
Drawing	2	Drawing	3
Analytic Geometry.....	3	Analytic Geometry.....	4
French or German	3	Chemistry	3
English.....	3	Geology	3
Shop, Iron-work	2	Shop, Iron-work	2

Junior Year.

Diff. and Integral Calculus.....	6	Applied Mechanics.....	5
Physics.....	4	Electricity and Magnetism....	3
Shop.....	5	Thermo-dynamics	2
Machine Design and Construction	3	Shop	5
		Mechanical Laboratory	3

Senior Year.

Applied Mechanics	5	Steam Engineering.....	5
Hydraulics and Hydraulic Motors.	3	Mill-work and Machinery.....	5
Steam Engine.....	3	Mechanical Laboratory	2
Shop.	3	Physical Laboratory.....	2
Metallurgy.....	2	Specifications and Contracts.....	1
Strength of Materials.....	3	Shop.....	2

Graduation Thesis.

XX. Department of Military Science.

SAMUEL A. SMOKE, 18th U. S. Infantry,
Professor of Military Science and Tactics, and Commandant of Cadets.

During the year now drawing to a close, 180 cadets have received instruction in this Department. The Cadets are organized in a battalion of four companies, a band and an artillery detachment, as follows:

<i>Battalion Staff and Non-Commissioned Staff.</i>	
Cadet Major.....	A. J. McCulloch.....
Cadet First Lieutenant and Adjutant.....	A. B. Griggs.....
Cadet First Lieutenant and Quartermaster.....	E. T. Allen.....
Cadet Sergeant Major.....	E. M. Stayton.....
Cadet Quartermaster Sergeant.....	J. S. Rogers.....
<i>Band.</i>	
Instructor.....	E. F. Pannell.....
Drum Major.....	C. Truitt.....
<i>Company A.</i>	
Cadet Captain.....	F. W. Niedermeyer.....
Cadet First Lieutenant.....	O. W. Granger.....
Cadet Second Lieutenant.....	E. W. Robinson.....
Cadet First Sergeant.....	Robert Moore.....
<i>Company B.</i>	
Cadet Captain.....	F. D. Wickham.....
Cadet First Lieutenant.....	K. Stone.....
Cadet Second Lieutenant.....	F. S. Balthis.....
Cadet First Sergeant.....	C. M. Barnes.....
<i>Company C.</i>	
Cadet Captain.....	T. W. Thompson.....
Cadet First Lieutenant.....	J. H. Holman.....
Cadet Second Lieutenant.....	G. R. Peake.....
Cadet First Sergeant.....	R. L. Fulton.....
<i>Company D.</i>	
Cadet Captain.....	H. B. Walker.....
Cadet First Lieutenant.....	H. T. Botts.....
Cadet Second Lieutenant.....	W. T. Jackson.....
Cadet First Sergeant.....	F. F. Thompson.....
<i>Artillery Detachment.</i>	
Cadet Captain.....	.....
Cadet First Sergeant.....	.....

Those Cadets are appointed to office who show ready obedience, zeal and capacity in the discharge of military duty. The Governor of Missouri issues commissions to those entitled by their battalion rank to receive them.

GENERAL SUPPLIES.

One hundred and fifty Springfield cadet rifles of the latest model, one Gatling gun, cal. 45, with full equipment, two 3-inch rifled field-guns, with carriages and implements, and a suitable amount of ammunition and target materials, are furnished by the United States. The State supplies ammunition, camp equipage, utensils, etc. The University supplies instruments and instruction for the band.

UNIFORMS.

Cadets wear but one style of uniform, known as the undress or fatigue uniform. Uniforms must be worn at all military exercises, and may be worn on all occasions. Tailor-made uniforms are supplied to volunteer cadets at a cost of \$16.50 each, including cap and gloves. The State furnishes uniforms to regularly appointed cadets free of cost.

COURSE OF INSTRUCTION.

FIRST YEAR—SECOND CLASS.

Practical instruction in the Schools of the Soldier, Company and Battalion (infantry), and Extended Order.

Practical instruction in rifle firing, 100, 200 and 300 yards.

Practical instruction in duties of camp, embracing guard duty, etc.

Recitations in Infantry Drill Regulations through School of the Company, ceremonies of Guard Mounting, Dress Parade, Inspection, Review, Muster and Extended Order.

Recitations in guard duty, rifle firing and cadet regulations.

SECOND YEAR—FIRST CLASS.

Practical instruction in the Schools of the Company and Battalion, and in Extended Order.

Practical instruction in the service of field-guns (foot battery), with mechanical maneuvers.

Practical instruction in rifle-firing, 100, 200 and 300 yards.

Practical instruction in the duties of camp, embracing guard duty, etc.

Practical instruction in military signaling.

Recitations in Infantry Drill Regulations, School of the Battalion.

Recitations in Artillery Tactics, manual of the piece dismounted.

Recitations in the elements of Field Fortifications.

Recitations in the elements of the Art of War.

Lectures on Army Organization, the Army of the U. S., the Regulations of the U. S. Army, the Regulations of the National Guard of Missouri, Courts-Martial and Military Law and the Customs of War, Street Fighting, etc.

CERTIFICATE OF PROFICIENCY.

To have passed through the entire course does not entitle a cadet to receive a certificate of proficiency in military science and tactics, but it is the rule now adopted in the department that the certificate will be issued to every cadet, State or volunteer, who takes the entire course and attains the second grade (at least 70 per cent) in *every examination* during the two years.

APPOINTMENT OF STATE CADETS.

The following extracts from the Militia law of the State of Missouri, enacted by the Thirty-fifth General Assembly, and now in force, will be of interest to those who desire to receive the appointment as cadet:

SEC. 5. The Military department of the University of the State of Missouri, as organized under section 1235, Revised Statutes of the United States, and section 7279, Revised Statutes of Missouri, 1879, is created the Missouri State Military School.

SEC. 6. The corps of cadets at the Missouri State Military School shall consist of one from each senatorial and representative district in this State, and shall be actual residents in the district from which appointed, and shall pass the required examination for admission to the University. Each Senator and Representative of the General Assembly of the State of Missouri shall appoint during the month of August in each year a cadet for such scholastic year.

SEC. 7. Cadets receiving instruction as provided in the preceding section shall be matriculated in all the academic departments of the University free from tuition fees, and subject only to the incidental fees and laboratory fees therein provided.

SEC. 8. The corps of cadets as provided in the preceding sections shall have the military organization prescribed for the National Guard of the State and reckoned a part thereof, and as such entitled to all such provisions as are or may hereafter be made for the National Guard of Missouri. The military government and discipline of the cadets shall be prescribed by regulations prepared by the Faculty of the University and approved by the Governor of the State.

No cadet will be received who is under 16 or over 25 years of age, or who is less than five feet one inch in height, or who is in any way physically disqualified for military service.

All male students of the University not physically disqualified, and who come within the limits of age and height, will be allowed to enroll themselves as voluntary cadets, but State cadets only will be matriculated in Academic departments of the University free of tuition, and provided with uniforms without expense to themselves. A copy of the regulations for the government of cadets will be given to each cadet upon his entrance into the Missouri State Military School. These regulations require cadets to enter and report to the commandant for duty *before* September 25th of each year. They should report by September 12th, if possible.

Cadet regulations prescribe that military drills, etc., shall be held at least three hours each week, one of which shall be for theoretical and two for practical instruction. The regulations also require an annual encampment of from eight to ten days, during which time the instruction is entirely military and practical. Here the cadets are put through all the duties of camp life. They conduct their own commissary and quartermaster departments. They have target practice at 100, 200, 300 and 400 yards, and perform the duties of sentinels, patrols, etc., and are given all the drills and ceremonies prescribed in the two years' course. The expenses of the camp are borne by the University.

SAMUEL A. SMOKE,

2d Lieutenant 18th Infantry U. S. Army,
Professor of Military Science and Tactics.

XXI. Department of Art.

_____, Professor.

XXII. Department of Elocution.

_____, Professor.

UNIVERSITY EXTENSION.

Upon the invitation of the Kansas City Society for University Extension, the following courses were offered during the current year:

Electricity and its applications, Professor Shrader; Semitic Languages, Professor Blackwell; History of the English Language, Professor Allen; History of Education, Professor Blanton; History of Mathematics, Professor Smith; Greek Life, Professor Manly; Roman Antiquities, Professor Jones; Pottery, Professor Purinton; Sidereal Astronomy, Professor Updegraff; Heat, Professor Lipscomb; Industrial History and Economics, Professor Hicks; Greek Art and Theatre, Professor Pickard; American Literature, Professor Wauchope.

The courses in Electricity and English were called for, and twelve lectures on each course were given to large classes by Professors Shrader and Allen.

TEACHERS' COURSE.

Special courses of instruction are offered by professors of the University to the teachers of the State, from April 1 to June 1, free of all charges. It is thought that many teachers, especially those whose school-term expires about the 1st of April, will avail themselves of this most practical form of University Extension. The instruction of specialists, dealing with the difficult points of each subject, presenting new methods and outlining work to be pursued by the teacher, together with the free use of the library and laboratories, cannot fail to be helpful and stimulating to those engaged in school work.

A pamphlet containing full information in regard to courses, expenses, etc., may be had by addressing Professor J. P. Blanton.

FARMERS' INSTITUTE.

As a legitimate department of the University extension work, the Faculty of the College of Agriculture and Mechanic Arts have, during the past year, taken an active part in the series of Farmers' Institutes, amounting to fifty, which have been held during the year under the auspices of the State Board of Agriculture in various portions of the State, and it is the policy of the University to continue this work, as far as it can be done without interfering with the regular duties of the various departments.

UNIVERSITY LIBRARY.

During the year 6936 volumes have been purchased for the Library. Of the \$13,000 expended for books, \$10,000 came from the insurance on the old Library. A Special committee of the Faculty made the selection of new books, which include, besides standard works, many of the latest and best works in the various departments of learning. The total number of bound volumes bought and given since the destruction of the Library by fire, in January 1892, is 11,583.

DONATIONS TO UNIVERSITY LIBRARY.

Donors.	Vols.	Donors.	Vols.
United States Government	740	Arkansas Geological Department....	6
“ “	295	American Swedenborg Society.....	4
“ “	154	St. Louis Academy of Science.....	6
Missouri State Agricultural Society	73	Anonymous.....	3
Michigan State University.....	63	American Humane Society.....	2
Minnesota Agricultural Society	57	Italian Oriental Society.....	1
Stock Associations	14	Agricultural Department of Georgia	1
Missouri State Government	14	Professor G. C. Broadhead.....	1
*Boston Public Library	58	T. J. J. See.....	1
*F. A. Brockhaus	399	Miss Katharine Iglehart.....	1
	161	J. P. Hubbell	1

*Special mention is made of the Boston Public Library and of Mr. F. A. Brockhaus, of Leipzig, Germany, for generous gifts.

PERIODICALS PURCHASED FOR CURRENT YEAR.

Academy (Boston)	Journal of American Medical Association..
Academy (London)	Journal of Nervous and Mental Diseases..
Agricultural Gazette	Journal of Anatomy and Physiology.....
Agricultural Science Monthly	Journal of Cutaneous and Genito-Urinary Diseases.....
Albany Law Journal	Journal of Physiology.....
American Antiquarian.....	Journal of Comparative Medical and Veterinary Archives
American Naturalist	Journal of Hellenic Studies.....
American Journal of Science.....	Journal of Royal Microscopical Society (London).....
American Journal of Mathematics.....	Journal of Society of Natural History.....
American Journal of Philology.....	Journal of Chemical Society (London)
American Microscopical Journal.....	Kansas City Journal (daily)
American Journal of Medical Sciences.....	Kansas City Star (daily)
American Law Review	Kansas City Times (daily)
American Geologist.....	Ladies' Home Journal
American Garden	Leslie's Illustrated Weekly.....
Andover Review	Lippincott's Magazine
Annals of Mathematics.....	London Lancet
Archives of Ophthalmology.....	London Quarterly
Archives of Othology.....	Magazine of American History.....
Arena	Medical Journal (New York)
Atlantic Monthly	Medical News.....
Braithwaite's Retrospect	Modern Language Notes
British Medical Journal.....	Nation.....
Century Magazine.....	New England Magazine.....
Chautauquan	Nineteenth Century.....
Chemical News (London)	North American Review
Christian Union.....	Poet Lore
Classical Review.....	Political Science Quarterly.....
Critic	Popular Science Monthly.....
Eclectic Magazine.....	Public Opinion
Edinburgh Review	Quarterly Review (London).....
Education.....	Review of Reviews.....
Educational Review.....	Revue des Deux Mondes
Electrical Engineer	Rhenisches Museum fur Philologie.....
Electrical World	Sanitarian.....
Engineering and Mining Journal.....	Scientific American
Engineering News.....	Scientific American Supplement.....
Forum	Serbner's Magazine
Gardener's Chronicle	Shakspeariana.....
Globe-Democrat (daily)	St. Louis Republic (daily)
Gynecology, Obstetrics and Pedology.....	Sunday School Times.....
Harper's Magazine	Truebner's Oriental Record.....
Harper's Weekly	University Magazine
Hebraica.....	University Extension Magazine
Hermes Zeitschrift.....	United Service.....
Independent (New York)	Youth's Companion.....
Johns Hopkins Hospital Reports	
Journal of Economics.....	
Journal of Education	

PERIODICALS PRESENTED TO THE LIBRARY.

American Economist	Mexico Ledger
Apostolic Guide	Mid-Continent
Centralia Courier	Monroe City News
Central Baptist	National Economist
Colman's Rural World	Nashville Christian Advocate
Columbia Herald	Post-Dispatch (daily)
Columbia Statesman	Richmond Christian Advocate
Cooper County Democrat	Saline County Progress
Cynosure	San Jose Herald
Hannibal Daily Journal	Shelbina Democrat
Kansas City Live-stock Indicator	St. Joseph Herald
Knox County Democrat	St. Joseph Gazette
Medical Mirror	St. Louis Christian Advocate
Merck's Medical Bulletin	Weekly Democrat-News
Mexico Intelligencer	

The reading room is open during the school-year, excepting Sundays and legal holidays, from 9 a. m. to 1 p. m., and from 2 p. m. to 5 p. m.

J. W. MONSER,
Librarian.

MISCELLANEOUS.

YOUNG WOMEN.

All departments of the University are open to women. There are special waiting-rooms furnished with all the proper equipment for health and comfort, and presided over by the Matron, Mrs. Kate Hendricks, who has charge of all the young ladies in attendance. In the lecture-rooms, they receive the same instruction and meet the same intellectual requirements as the young men. During lecture hours—that is, from 9 a. m. to 4 p. m.—the young ladies are expected to be in their waiting-rooms, or in the University Library, or at their respective homes.

The Matron does no teaching, but gives her entire time to her duties in the Ladies' waiting-rooms. She is the confidential friend and adviser of the young ladies under her charge, and it is especially her duty to exercise watchful care over their health, manners and general conduct.

The University has no boarding department; but most of the families of Columbia take boarders, and students find no trouble in securing, at reasonable rates, the comforts and refinements of home life. For young women, especially, we consider this peculiarly fortunate.

There are six churches of different denominations in Columbia. For information about the Young Women's Christian Association and the Philaethean and Thalian Literary Societies, all of which are composed of students of the University, see pages 81 and 82.

DIRECTIONS FOR NEW STUDENTS.

1. New students will first present themselves to the President, who will issue to them a card of admission to the examinations. This should be done *before paying tuition fees*. Examinations for admission will be given by the English and Mathematical and Agricultural departments on Thursday, Friday, Saturday and Monday (September 7th, 8th, 9th and 11th) preceding the opening of the University. If assistance is needed in obtaining board, application should be made to the Proctor.

2. After passing the entrance examinations, the student must pay to the Treasurer the amount required. See pages 79-80.

3. The Treasurer's receipt should be at once presented to the Proctor, when the name of the student will be entered upon the University roll.

4. The card received from the Proctor must be presented to the Secretary of the University, who will enroll the student's name and give to him his class-card, with instructions how to have it filled.

5. Class-cards must be properly filled, countersigned and deposited with the Secretary of the University within three days after they have been issued. In the Academic department, cards are countersigned by the President; in any professional department, by the Dean first and then by the President.

DISCIPLINE.

The rules for the government of students are published in pamphlet form, and may be had on application to the Librarian. Every student is expected to procure a copy immediately upon entrance.

CHAPEL EXERCISES.

Religious exercises are held every morning from 8:45 to 9 o'clock in the chapel. They consist of readings from the Old and the New Testaments, a brief prayer, and a song by the choir. Prompt attendance and orderly conduct are required of every student in the University.

STUDIES.

Academic students are expected to have not less than fifteen nor more than twenty hours per week at lectures or recitations, and the number may not exceed eighteen without special permission of the Faculty. One hour in the lecture-room is considered equal to two in the laboratory, drawing-room or shop. Class-cards, when once filed with the Secretary, can be changed only by Faculty action.

EXAMINATIONS AND CLASS HONORS.

1. Examinations at the end of each semester close the studies pursued to that point. Re-examinations for substitution of grades are not allowed after the lapse of one scholastic year.

2. The honor of appearing as valedictorian at Commencement is awarded to that student who has the highest grade.

3. All special examinations are in the discretion of the heads of departments.

DEGREES.

The following degrees are now conferred by the University:

In the Academic department, A. B. (Bachelor of Arts), L. B. (Bachelor of Letters), and S. B. (Bachelor of Science).

In the Law department, LL. B. (Bachelor of Laws), and LL. M. (Master of Laws).

In the Engineering department, C. E. (Civil Engineer), E. E. (Electrical Engineer), M. E. (Mining Engineer), and Mech. E. (Mechanical Engineer).

In the Agricultural College, B. Agr. (Bachelor of Agriculture), M. Agr. (Master of Agriculture).

In the Normal department, Pe. B. (Bachelor of Pedagogics).

In the Medical department, M. D. (Doctor of Medicine).

In addition to the above, the usual Master's degrees and the degree of Ph. D. are conferred upon the completion of sufficient graduate work.

Except that of LL. D., no degree is conferred in course or *honoris causa*.

REQUIREMENTS FOR THE MASTER'S DEGREES.

The Master's Degree is not given in course nor *honoris causa*, but may be attained by at least one year's graduate study of advanced character, at least half of which must be in some one department of the University, and the whole of which must be approved both in kind and in amount by the heads of the departments concerned. The applicant for the degree must be recommended by the University Faculty to the Curators after favorable report by the Committee on Degrees.

REQUIREMENTS FOR THE DOCTOR'S DEGREES.

The requirements for the degree of Doctor of Philosophy or of Science are:

1. That the candidate shall have received a Bachelor's degree (in Arts, Letters, Science, or Philosophy) from some reputable University or College.
2. That he shall have attained, in a current graduate study pursued at this University, a high proficiency in some one branch of learning and respectable proficiency in at least one other.
3. That he shall have submitted a dissertation evincing capacity for original research and power of independent thought.

The attainment of the doctorate is not a mere matter of fidelity nor of diligence, nor of duration of effort. No definite course can be prescribed and no period of time specified, but in general the candidate will be expected to spend three years, or if he have a Master's degree, two years, in graduate study under University direction, but with Faculty approval one of these years may in either case be spent *in absentia*.

CERTIFICATES.

A certificate in surveying is granted by the Engineering department, and also one in practical Electrical work; one in Pedagogics is given by the Normal department, and one in the two-years' course in Agriculture; also one in the Military department.

PRIZES.

Stephens Medal—Founded by the Hon. James L. Stephens, a retired merchant of Columbia, and annually awarded for the best oration by a member of the Senior class.

The prize consists of a book in defense of the Christian religion, and a gold medal, for the purchase of which the annual interest on \$500 is available.

Junior Medal—This prize, offered by the literary societies for the best oration, is open to all students of the University below the Senior year.

Declamation Medal—This prize is offered by the literary societies to the best declaimer.

The Laws Astronomical Medal—For conditions of award, see Mathematical department.

Dachsel Prize—\$10 in money, by Charles Dachsel, engineer, Jefferson City, Mo., is awarded for best thesis on steam engine.

McAnally Medal—For best English essay. (See English department, page 9)

Latin Prize—See Latin department.

Rollins Scholarships—See page 80.

For High School Scholarship, see page 35.

FEES AND EXPENSES.

Academic students pay an entrance fee of \$10 and a library and incidental fee of \$10; but if the student enters at the opening of the second semester, the library and incidental fee is reduced to \$5, making the sum of the fees \$15.

The Law student (regular or special) pays \$50 a year. Students who enter the Law department after January 1 pay \$35 for the remainder of the session. Graduates of the Law department may continue their studies a third year, or longer, for an annual fee of \$10.

The Medical student pays \$20 for the first year; for the second year, \$50; for the third year, \$50: this includes the demonstrators' ticket.

The Engineering student pays \$20 for the Freshman year and for the Sophomore year; for the Junior and Senior years he pays \$50 each. State cadets in the Academic department pay \$10 the first semester. If they enter at the opening of the second semester, they pay \$5; in all the other departments of the University they pay the regular fees.

Agricultural students pay \$10 in lieu of all other charges.

Graduate students, in any department, pay an entrance fee of \$10 and the usual laboratory fees.

A uniform fee of \$4 is charged in all laboratories (Physics, Chemistry, Biology, Geology) and a conditional fee of \$5 more is charged in the Chemical laboratory, to cover breakage, abuse, etc.

All fees must be paid upon entrance.

The fee for diplomas is \$2. Payment must be made to the Treasurer of the University and his receipt handed to the Secretary of the Faculty before the name of the applicant is recommended to the Curators for the degree.

GRADUATE STUDENTS.

All graduates of regularly chartered Colleges and Universities of the State of Missouri, authorized to confer the degrees of A. B., A. M., S. B., LL. B., M. D., C. E., Ph. D., and similar degrees, may be admitted to the University as graduate students in their special line of graduation upon payment of the contingent and laboratory fees. See pages 79-80.

MINISTERS AND STUDENTS PREPARING FOR THE MINISTRY.

All regularly ordained ministers of the Gospel belonging to any of the religious denominations of this State in good standing may, without payment of fees, attend any of the departments of the University, except those of Law, Medicine and Engineering. The same privilege is extended to any young man in the State preparing for the ministry who shall submit to the President and Faculty of the University satisfactory testimonials, that he is in good faith a candidate for the ministry, and that without aid he is unable to meet the expenses of education at the University.

THE JAMES S. ROLLINS UNIVERSITY SCHOLARSHIPS.

In 1883, the Hon. James S. Rollins left six thousand dollars (\$6,000) to endow six scholarships in the University—"the interest" on this \$6,000 "to be forever used and appropriated under the authority and by the direction of the Board of Curators of the University of the State of Missouri for the following purposes, that is:

"To found scholarships to be awarded by the President and Faculty of the University—the vote in each case to be by ballot—as a reward for excellence and promise in—

"*First*—The College of Arts, for the degree of A. B., fifty dollars.

"*Second*—The College of Arts, for the degree of S. B., fifty dollars.

"*Third*—The College of Agriculture and Mechanic Arts, for the degree of B. Agr., fifty dollars.

"*Fourth*—The College of Law, for the degree of LL. B., fifty dollars.

"*Fifth*—The College of Medicine, for the degree of M. D., fifty dollars.

"*Sixth*—The College of Engineering, for the degree of C. E., fifty dollars.

"These scholarships are intended as a recognition of merit and character in the beneficiaries, and shall be payable on the first day of June of each year to that member of the *Junior class*, in each of the colleges designated, who shall be adjudged entitled to it by the President and Faculty; and the names of the persons receiving said scholarships shall be publicly announced on Commencement day by the President of the University.

"In according these scholarships, it is earnestly impressed upon the President and Faculty of the University, that in the mind of the donor, purely intellectual and literary

ability are not alone to be considered, but that the moral character of the contestants should be regarded as a factor of no small weight in coming to a decision.

"With the earnest hope that by the means here provided, worthy young men and women may in all coming time be helped and encouraged in their struggle toward a higher life and greater usefulness, this fund is committed to the honor and good faith of the State, whom the Board represents, and by whose authority the donation is made and accepted.

I am very respectfully,

(Signed)

JAMES S. ROLLINS."

ROLLINS AID FUND.

Anthony W. Rollins, M. D., an honored citizen of Boone county, father of the Hon. James S. Rollins, on dying in 1845, left by his will the sum of \$10,000 in trust for the purpose of educating such poor and indigent youths of Boone county, both male and female, as might be unable to educate themselves. Three-fourths of the annual interest on the fund, according to the directions of the donor, is to be devoted to the education of the youths of Boone county, and the remaining fourth is to be added to the interest-bearing principal. The fund amounts now to about \$40,000. The beneficiaries of this charity are annually selected by the President of the University from the indigent youths of Boone county, male and female. In compliance with the wishes of the donor, the selection is made with reference to the moral as well as intellectual qualities of the youths inclined to avail themselves of the advantages of the fund, preference being given, in the selection of boys, to such as evince an inclination to preach the gospel.

Applications for aid from the Rollins fund must hereafter be in writing; a blank form will be furnished by the Proctor, with whom it must be filed after it has been filled. The applicant must appear in person at the opening of the first semester, September 12, as no reservation will be made.

BOARDING.

Board in private families, with lodging, washing, fuel and lights, may be obtained for from \$3 to \$4.50 a week.

The club-houses afford accommodations for 122 students. The room-rent for each student is \$10, payable on or before the first day of September. The cost of board, room-rent, fuel, lights and washing, to those who enter a club, is about \$1.75 a week. Each room is furnished with a double bedstead, a stove, a table and two chairs. The occupants are expected to furnish whatever else they deem necessary.

The members of a club have their own officers—president, commissary, secretary, censors, etc. They levy and collect assessments, buy their own provisions, and thus regulate their own expenses.

Students in the College of Agriculture and Mechanic Arts will have the preference of rooms in the two Agricultural club-houses, provided application be made before the opening of the first semester, in September; but they will pay the same rent as other students. These two buildings accommodate 32 men.

As the accommodations of the club-houses are limited, it is necessary for students who wish to engage rooms to make early application for them, as they are frequently all engaged before the opening of the college year. The rooms are assigned in the order of application, and requests for them must be made to the Proctor of the University.

LITERARY SOCIETIES.

There are three Literary Societies of young men and two of young women connected with the University, viz.: The "Athenæan," the "Union Literary," the "Bliss Lyceum," the "Philalethean" and the "Thalian." These societies hold weekly meetings for improvement in debate, declamation, oratory and composition, are in a flour-

ishing condition, and form a most important means of culture, especially in speaking and writing.

An address is delivered before them, during Commencement week, and society diplomas are given to such members as belong to the graduating class.

THE ARGUS, a fortnightly periodical, is the organ of the Literary Societies.

YOUNG MEN'S CHRISTIAN ASSOCIATION.

The object of this organization, which dates its existence in the University of Missouri from January 18, 1890, is quite the same as in other such institutions of learning, namely: to represent and in every proper way to promote practical Christianity, particularly among the students. The work has been rich in good results, and it has all along enlisted the sympathy and co-operation of the Faculty and the authorities of the University.

Devotional exercises are held Sunday afternoon in the hall of the Association, with an average attendance of nearly 100. Classes hold weekly meetings for the study of the Bible, and special religious services are held from time to time.

A movement of great importance has been set on foot: to erect a building to cost at least \$40,000, for the Young Men's and Women's Christian Associations. For this purpose, the former has already pledged the sum of \$6500, and any encouragement from sympathetic friends will be gratefully acknowledged. It is intended that the building shall be complete in its appointments, containing commodious rooms for reading, lectures, Bible classes, University class organizations, meetings of the Alumni and of the Christian associations, as well as bath-rooms and a gymnasium—in short, an edifice in which the whole State may feel pride and interest.

A lot immediately in front of the University campus has been purchased for the site of this building, at a cost of \$2350, of which about \$1000 has already been raised by the students.

At the beginning of each scholastic year, a committee from the Y. M. C. A., to be recognized by their badges, will meet students at the trains and freely render them often valuable assistance in securing them boarding by introducing them to friends and to officers of the University, and by various other acts of kindness. A letter sent in advance to the President of the Young Men's Christian Association will receive prompt and cheerful attention.

The Association also offers annually to the public, particularly to the students, at actual cost, a series of literary and musical entertainments of high order and excellence.

YOUNG WOMEN'S CHRISTIAN ASSOCIATION.

This Association is similar in its aims and methods to the foregoing. It was organized April 2, 1891, and its membership has grown from 32 to 50. Its object is the prosecution of Christian work and the development of Christian character, particularly among the young women of the University. Its weekly meetings are held at 4 p. m. every Sunday, one of them every month being a union meeting in conjunction with the Y. M. C. A.

Equally with the Young Men's Christian Association, the Young Women's shares the hearty and unanimous sanction and encouragement of the Faculty and authorities of the University.

ALUMNI.

The Alumni Association is composed of graduates of the University. It holds an annual meeting on Wednesday and Thursday of Commencement week, and is addressed in the University chapel by an orator previously selected from its own body.

The objects of this society are the promotion of education, especially in the halls of the Alma Mater, the reunion of early friends and co-laborers in literary pursuits, and the revival of those pleasing associations which entwine themselves about academic life.

The fee for membership is \$2. This is added to the permanent fund, only the interest of which is used. It is hoped that all graduates of the University, whether academic or

professional, will become members of the Association. The University Librarian solicits aid in securing facts for the next triennial, and will be thankful for published notices of officers and graduates, and for books, pamphlets and articles published by them.

The officers of the Association are: President, Hon. Gardiner Lathrop, Kansas City; First Vice-President, Hon. D. W. B. Kurtz, Columbia; Second Vice-President, Dr. H. W. Loeb, St. Louis; Secretary, C. B. Sebastian, Columbia; Treasurer, N. T. Gentry, Columbia; Orator '93, Mrs. Sallie Gentry Elston, Kansas City; alternate, F. N. Peters, Carrollton, Mo.

A subscription fund of \$3000 has been raised and placed at interest, which is used in defraying the expenses of the annual meeting at Commencement—a very enjoyable and also a very profitable occasion. The Alumni constitute in fact one of the largest elements in the life of the University, and, efficiently organized, may become the most powerful agent in her development and prosperity. No effort should be omitted, both to strengthen the central organization at Columbia and to extend its branches throughout the State.

Officers of the Local Chapters of the Alumni Association.

Chillicothe:

T. F. Spencer, President.
Scott L. Miller, Secretary.

Clarksville:

Dr. C. W. Pharr, President.
Arnold Manns, Secretary.

Cambridge, Mass.:

W. W. Clendenin, President.
C. M. Hibbard, Secretary.

Denver, Colorado:

T. M. Field, President.
J. T. Bottom, Secretary.

Fort Smith, Arkansas:

F. A. Youmans, President.
M. D. Hunton, Secretary.

Huntsville:

Dr. John T. Fort, President.
Wm. Palmer, Secretary.

Jefferson City:

Henry W. Ewing, President.
Frank M. Brown, Secretary.

Kansas City:

J. V. C. Karnes, President.
Shannon C. Douglass, Secretary.

Macon City:

R. W. Barrow, President.
John F. Williams, Secretary.

Moberly:

Judge B. S. Head, President.
F. G. Ferris, Secretary.

Richmond:

Thomas N. Lavelock, President.
F. P. Divelbiss, Secretary.

Salisbury:

Miss Leila Britt, President.
L. W. Martin, Secretary.

Santa Fe, New Mexico:

———, President.
N. B. Laughlin, Secretary.

Sedalia:

Charles E. Yeater, President.
Louis Hoffman, Secretary.

Silver City, New Mexico:

G. W. Miles, President.
R. H. Theilman, Secretary.

Springfield:

Hon. J. C. Cravens, President.
J. P. Bates, Secretary.

Slater:

Ulie Denny, President.
Gay Hancock, Secretary.

St. Joseph:

Judge H. S. Kelley, President.
W. H. Utz, Secretary.

St. Louis:

Judge Warwick Hough, President.
R. H. Phillips, Secretary.

XXIII. School of Mines and Metallurgy.

Executive Committee.

GEN. E. Y. MITCHELL.....	Rolla
JOHN S. LIVESAY, Esq.....	Rolla
HON. CHARLES C. BLAND	Rolla

Officers of the Committee.

EWING Y. MITCHELL	Chairman
DAVID W. MALCOLM	Treasurer
W. M. SMITH	Secretary

FACULTY.

RICHARD HENRY JESSE, LL. D.,
President of the University.

ELMO G. HARRIS, C. E.,
**Director and Professor of Engineering.*

WALTER BUCK RICHARDS, M. A.,
Professor of Mathematics.

AUSTIN LEE McRAE, Sc. D.,
Professor of Physics.

WILLIAM H. SEAMON, B. A. S.,
Professor of Chemistry and Metallurgy.

_____,
Professor of Mines and Metallurgy (to be appointed soon).

THOMAS LEWIS RUBEY, A. M.,
Secretary, and Instructor in Academic Department.

PAUL J. WILKINS, B. S.,
Instructor in Academic Department.

THOMAS GRAYSON POATS,
Instructor in Drawing and Shop-work.

DANIEL C. JACKLING, B. S.,
Assistant in Chemistry and Metallurgy.

CLIFTON B. SPENCER,
Assistant in Engineering and Mathematics.

*Professor Harris has resigned his position as Director, to take effect July 1, 1893. He will be succeeded as Director by Professor Richards.

INTRODUCTORY STATEMENT.

The School of Mines and Metallurgy was founded in 1870, under the act of Congress, approved July 2, 1862, entitled "An act donating lands to the several states and territories which may provide colleges for the benefit of agriculture and the mechanic arts," as a department of the College of Agriculture and Mechanic Arts in the University of the State of Missouri.

It is located at Rolla, a city of 2000 inhabitants, on the St. Louis & San Francisco railroad, about midway between St. Louis and Springfield, 1100 feet above sea-level, in a pre-eminently salubrious region.

The course of instruction deals in detail with the principles and the practice of Engineering, with special reference to Mining Engineering, Civil Engineering, Chemistry and Metallurgy, Mathematics, Physics and Electricity, and includes recitations, lectures, laboratory work and field practice. While a theoretical knowledge of each subject is required, great importance is attached to laboratory work and field practice as a source of mental training as well as a preparation for active pursuits. In the first of these, while a certain standard of excellence must be attained by all, the class system is not adopted, but each student, working independently of others, advances as rapidly as possible.

At the close of the year each member of the Senior class presents to the Faculty some independent investigation in a subject included in his course. These theses, together with all drawings to illustrate them, are preserved in the library of the school.

Provisions are now made for the following technical courses:

- I. Mining Engineering.
- II. Civil Engineering.
- III. Mechanical Engineering.
- IV. Chemistry and Metallurgy.
- V. Mathematics and Physics.

Each leading to the degree of Bachelor of Science.

The requisites for admission to any of these courses are passing grades in the subjects taught in the preparatory course. All the Engineering courses are the same through the Junior year; beyond it they diverge as outlined below.

Besides these regular courses, there are the following special ones:

- I. Assaying.
- II. Surveying.
- III. Electricity.

On the satisfactory completion of any one of these a certificate of proficiency will be given. The requisite for admission to any one of these courses is an adequate knowledge of the preparatory subjects.

SCHEME OF STUDIES.

[The numbers in parenthesis refer to the exercises per week.]

ENGINEERING COURSES.

JUNIOR YEAR.

First Semester.—General Chemistry (3), Elementary Mechanics (2), Descriptive Geometry (2), Surveying (1), Trigonometry (5), Chemical Laboratory (3), Field-Work (2), Drawing (1).

Second Semester.—General Chemistry (3), Elementary Mechanics (2), Stereotomy (1), Geodesy (2), Analytic Geometry (3), Chemical Laboratory (3), Field-Work (2), Drawing (1).

MINING ENGINEERING.

INTERMEDIATE YEAR.

First Semester.—Analytic Geometry and Calculus (3), Physics (3), Ore Concentration (2), Mineralogy (3), Engineering (3), Field-Work (2), Physical Laboratory (2), Chemical Laboratory (3).

Second Semester.—Physics (3), Fuels, Furnaces, etc. (2), Geology (3), Engineering (2), Chemical Laboratory (3), Physical Laboratory (2).

SENIOR YEAR.

First Semester.—Analytic Mechanics (3), Metallurgy (2), Dynamo-Electric Machinery (2), Mining Engineering (5), Physical Laboratory (2), Chemical Laboratory (3).

Second Semester.—Metallurgy (2), Electric Transmission of Energy (2), Mining Engineering (5), Physical Laboratory (2), Chemical Laboratory (3). Thesis.

CIVIL ENGINEERING.

INTERMEDIATE YEAR.

First Semester.—Same as in Mining Engineering.

Second Semester.—Calculus (3), Physics (3), Geology (3), Civil Engineering (3), Field-Work (2), Physical Laboratory (2).

SENIOR YEAR.

First Semester.—Analytic Mechanics (3), Dynamo-Electric Machinery (2), Civil Engineering (5), Field-Work (2), Physical Laboratory (2), Drawing (2), Practical Photography (1).

Second Semester.—Astronomy (1), Electric Transmission of Energy (2), Civil Engineering (5), Field-Work (2), Physical Laboratory (2), Drawing (2). Thesis.

MECHANICAL ENGINEERING.

INTERMEDIATE YEAR.

First Semester.—Same as Mining Engineering, except Shop Practice instead of Field-work.

Second Semester.—Same as Civil Engineering, except Shop Practice for Field-work, and Mechanical for Civil Engineering.

SENIOR YEAR.

First Semester.—Analytic Mechanics (3), Dynamo-Electric Machinery (2), Mechanical Engineering (5), Shop Practice (2), Physical Laboratory (2), Machine Design and Drawing (3).

Second Semester.—Electric Transmission of Energy (2), Mechanical Engineering (5), Physical Laboratory (2), Shop Practice (2), Machine Design and Drawing (3).

CHEMISTRY.

JUNIOR YEAR.

First Semester.—General Chemistry (3), Elementary Mechanics (2), German (5), Trigonometry (5), Chemical Laboratory (3).

Second Semester.—General Chemistry (3), Elementary Mechanics (2), German (5), Analytic Geometry (5), Chemical Laboratory (3).

INTERMEDIATE YEAR.

First Semester.—German (5), Ore Concentration (3), Mineralogy (3), Chemical Laboratory (25).

Second Semester.—Same as first semester, except Geology in lieu of Mineralogy.

SENIOR YEAR.

Both Semesters.—Metallurgy (2), Chemical Laboratory (50).

Department of Engineering.

ELMO G. HARRIS, Professor. T. G. POATS, Assistant.

In this department constant effort is made to give the student a working knowledge of his subject. He is taught to obtain practical results in the most direct and economical way, and is daily exercised in such problems as will come up in practice. In field practice the Juniors enter the corps as rodmen, the Intermediates as instrument-men, while the Seniors are placed in charge, under direction of the instructor.

The department is equipped with field instruments of the best make, sufficient for two full corps at once.

MINING ENGINEERING.

JUNIOR.

First Semester —Descriptive Geometry: Parallel and central projections as applied in draughting, with constant exercises in determining orthogonal and oblique projections of familiar objects.

Field-work.

Second Semester.—Stereotomy: Descriptive Geometry as applied to the art of stone-cutting.

Field-work.

First Semester.—Field Instruments: The field instruments of the engineer dissected and studied in detail as to theory, construction, adjustment, uses and capabilities.

Second Semester.—Engineering Geodesy: General and particular methods of traversing, triangulating, direct and indirect leveling; land, city, topographical and hydrographical surveying; United States system of subdivision of land.

Field-work. Drawing.

INTERMEDIATE.

First Semester.—Mine Surveys.

Exploitation of Mines: Theory of deposits in beds, lodes and pockets; prospecting, exploration and development by shafts, inclines and tunnels; underground transportation, drainage, ventilation, lighting.

Second Semester.—Tunneling, Masonry, Quarrying: Strengths of stone and brick, cements, mortars; foundation, stability of masonry structures; engineering materials, drawing.

SENIOR.

First Semester.—Hydraulic: Collection and measurement of water, conveyance through pipes and canals; designs of dams and pipe-lines.

Prime Movers: Hydraulic motors, steam engines and boilers, horse-power appliances.

Graphical Statics.

Second Semester.—Transmission of power: Cable, compressed air, electricity.

Mining Machinery: Pumps, ventilators, hoists, drills.

Mechanical Concentration of Ores.

Drawing. Thesis.

CIVIL ENGINEERING.

Junior year and second semester of the Intermediate same as under Mining Engineering, with the addition of field work.

INTERMEDIATE.

First Semester.—Railroad Engineering: Surveys, construction and maintenance.

Highway Engineering: Surveys, construction and maintenance; street paving.

Field-work. Drawing.

SENIOR.

First Semester.—Same as under Mining Engineering.

Second Semester.—Bridge Engineering: Determination of loads, strains and dimensions for bridges, roofs and other framed structures.

Sanitary Engineering: Water supply of cities and towns, sewerage, irrigation.

Field-work. Drawing. Thesis.

MECHANICAL ENGINEERING.

JUNIOR.

Identical with Junior Mining Engineering, with shop practice substituted for field-work.

INTERMEDIATE.

First Semester.—Same as first semester in Intermediate Mining Engineering.

Second Semester.—Kinematics. Drawing. Shop Practice.

SENIOR.

First Semester.—Same as first semester in Senior Mining Engineering.

Second Semester.—Transmission of power: Cable, compressed air, electricity.

Mechanics of Machines.

Drawing. Thesis.

DRAWING.

FIRST YEAR.

Most of the first year's work in the Engineering department is at the drawing-board. Here belongs naturally all work in Descriptive Geometry and in Stereotomy. The use of drawing instruments—simple problems in points, lines and planes—graphical solution of the more complicated problems—shading of projections, in pencil, by free-hand pen-work, with the ruling-pen, in water-colors and India ink.

SECOND YEAR.

Work assigned according to the profession chosen by the student. The students in Civil and in Mining Engineering will select some complete engineering structure and present it in simple plan and elevation—one in axonometric, another in perspective—all neatly shaded, tinted and lettered. All field surveys must be platted neatly, and one topographical drawing made from notes taken in the field by the student will be required of each. The student in Mechanical Engineering will be continuously exercised in mechanical and machine drawing.

THIRD YEAR.

Seniors have a variety of exercises in Graphical Statics, and are required to present working drawings of many structures, such as bridges, arches, dams, etc. The thesis must be accompanied by drawings fully illustrating it.

Department of Chemistry and Metallurgy.

W. H. SEAMON, Professor. D. C. JACKLING, Assistant.

The courses in this Department have been arranged solely for the benefit of those who wish to prepare themselves for positions as Assayers, Chemists and Engineers. Instruction in the following courses is regularly given each session:

I. General Chemistry.—The instruction in this subject is communicated by lectures and recitations based upon Cook's Chemical Philosophy. Much time is devoted to regular exercises in Stoichiometry.

II. Ore Concentration.—The instruction in this subject is exhaustively treated by lectures, and covers the following ground: 1. Physical properties upon which ore-dressing is based. 2. Theory of jigging and treatment of slimes. 3. Hand-dressing, cobbing, etc. 4. Crushing machinery. 5. Sizing machinery. 6. Assorting machinery; jigs, vanners, revolving tables, puddlers, settlers, etc. 7. Types of ore-dressing plants. Drawings and photographs are employed to illustrate the work.

III. Metallurgy.—During the second term of the Intermediate year, Fuels, Refractory Materials, Furnaces and the general principles of Metallurgical operations are studied; followed in the Senior year by a thorough consideration of Metallurgy of Iron, Steel, Lead, Copper, Zinc, Silver and Gold. Philip's Elements of Metallurgy and the Professor's notes on American practice cover the course.

Works of Reference.—Crook's and Rohrig's, Eggleston's and Percy's Works and the Transactions of the American Institute of Mine Engineers.

IV. Blowpipe Analysis.—Fifteen hours each week, during the first term, are devoted to practical exercises with the blowpipe. The student is required to attain skill sufficient to readily detect the common metals, bases and acids in all their forms of occurrence. Erni's Blowpipe Analysis is used as a guide.

V. Qualitative Analysis.—Fifteen hours each week of the second term are devoted to practical exercises in Qualitative Analysis. The difficulties of these exercises are gradually increased and continued until the student is perfectly familiar with the subject.

VI. Assaying and Technical Analysis.—After the completion of the exercises in Qualitative Analysis, the student is required to make complete analyses of Barium Chloride, Di-Sodic Phosphate, Strontium Nitrate and Nickel Ammonium Sulphate.

This work is intended for the proper training in chemical manipulation necessary for accurate Quantitative work. The quick methods, fire, volumetric and gravimetric, employed by assayers and chemists in metallurgical plants are then taught and applied by the students to the analysis of ores of Copper, Zinc, Lead, Iron, Antimony, Tin and Manganese. Steel, Cast-Iron, Mattes, Slags, Fluxes and furnace materials are also considered and analyzed by the students. About 24 hours each week are required to complete the course mapped out.

VII. Mineral and Gas Analysis.—The work in this course requires 30 hours per week, and is intended to familiarize the student with the most accurate methods of analysis. Different methods of analysis are investigated and rare minerals examined, for the purpose of encouraging a spirit of investigation in the student.

The Professor's notes in conjunction with Fresenius' Qualitative and Quantitative Analysis are used as texts.

THE CHEMICAL LABORATORY.

The Chemical Laboratory has been in use six years, and has been found satisfactory. It was planned and built solely with reference to the work in the school, and the entire building is used by the Chemical department.

It consists of the quantitative laboratory, the qualitative laboratory, professor's laboratory, lecture room, assay laboratory and weighing room, a quantitative and qualitative evaporating room, preparation room, a supply room and two basement rooms, and furnishes accommodations for seventy-five students.

No pains have been spared to make the assay laboratory complete in every respect. It is located on the first floor, and not in the basement. The reduction furnace, as well as the muffle furnaces, is of the newest and best. Two large muffle furnaces, two smaller ones, one gas furnace, an ore crusher, pulverizing plate, ore and assay balances, with other facilities, are provided for the use of students.

Facilities for securing heat, light and ventilation are excellent; ample provision is also made for carrying off foul and dangerous gases; gas and water are supplied to each table. All parts of the building are thoroughly and judiciously equipped, and nothing has been left undone to make this laboratory one of the most complete in the country.

It is open to students daily from 8 a. m to 5 p. m.

Department of Mineralogy and Geology.

W. H. SEAMON, Professor.

The instruction on these subjects begins with Determinative Mineralogy in the Junior year, and is continued with Systematic Mineralogy, Petrology and Geology in the Intermediate year.

Models, diagrams, natural crystals and goniometers are used in imparting a knowledge of the principles of Crystallography.

The course in Mineralogy is fully illustrated by a complete and well-arranged cabinet of minerals.

In addition to the usual course of Dynamical, Structural and Historical Geology, special attention is given to Chemical and Economic Geology. The course of instruction embraces the origin of vein stones and ore deposits, mineral waters, coal, petroleum and natural gas.

The study of geology is made interesting and practical by complete stratigraphical and paleontological collections, and by field-work and excursions.

Department of Mathematics.

W. B. RICHARDS, PROFESSOR.

JUNIOR.

First Semester.—Trigonometry, Plane and Spherical, Fundamental Definitions and Formulæ—Construction and use of Logarithmic tables—Solution of triangles—Computation of actual heights and distances.

Second Semester.—Conic Sections and a few Higher Plane Curves.

Text-books: Wells' Plane and Spherical Trigonometry, Wentworth's Analytic Geometry. For reference—Todhunter's Plane and Spherical Trigonometry, Puckle's Conic Sections, Salmon's Conic Sections, Searle's or Henck's Field-book. Daily, both semesters, required in all the courses.

INTERMEDIATE.

First Semester.—Analytic Geometry of Three Dimensions, chiefly the Conicoids.

Second Semester.—Infinitesimal Calculus.

Text-books: Venable's Notes on Solid Geometry, Taylor's Elements of the Calculus (with Notes and Lectures). For reference—Salmon's, Todhunter's and Williamson's mathematical works. Thrice weekly, required in Courses I, II, III, V.

For students in Mining Engineering, to compensate for larger requirements in Chemistry and Metallurgy, a briefer treatment of the above subjects, extending through one term, will be given.

SENIOR.

Designed only for students in the special course in Mathematics and Physics (V), and such others as may wish to extend their mathematical studies beyond the usual undergraduate range; subject to variation from year to year, at the Professor's discretion, to meet the needs and accord with the purposes of the applicants.

First Semester.—Analytic Geometry and Calculus, select chapters of Salmon's Conic Sections and Williamson's Differential and Integral Calculus.

Second Semester.—Select portions of some two of the following subjects: Projective Geometry (Cremona), Theory of Equations (Todhunter), Determinants (Muir), Differential Equations (Forsyth), Quaternions (Kelland & Tait, and Tait).

Lectures on the history of Mathematics are given during the year.

The library contains the chief works on mathematics, in English, French and German, and affords the student an opportunity of extending his research at will.

Department of Physics.

A. L. McRAE, Professor.

JUNIOR.

Both Semesters.—Elementary Mechanics: Twice weekly.

INTERMEDIATE.

Physics: This class meets three times a week and spends two afternoons a week in the Physical laboratory.

First Semester.—Meteorology, with special reference to rainfall and water supply; Heat, general principles, thermometry and calorimetry; Optics, optical instruments and photometry; Measurements in laboratory.

Second Semester.—Electricity and Magnetism; Telegraph and Telephone Circuits; Electrical testing in laboratory.

SENIOR.

First Semester.—Practical Photography: Required of students in Civil Engineering, elective for others. Once weekly.

Analytic Mechanics: Thrice weekly.

Second Semester.—Practical Astronomy: One lecture a week on determining time, latitude and longitude.

Electric Transmission of Energy: Two lectures a week. Electric lighting, electric railways, electric pumping, hoisting and ventilating apparatus will be studied.

Two afternoons a week throughout the year are spent in the laboratory.

Students in Metallurgy will also receive instruction in the electrical methods used in the extraction, purification and deposition of metals.

Graduate or special students in Physics, after completing the prescribed course, may take up Mascart and Joubert's Electricity and Magnetism, Fourier's Theory of Heat, Minchin's Kinematics and Williamson's Dynamics or Practical Electrical Engineering.

MODERN LANGUAGES.

A reading knowledge of French and German is a highly desirable part of a scientific education. The press of more immediately essential subjects has kept these languages from being included among the requirements of the Engineering degrees, though every student who can spare the time is advised to acquire at least one of them. In the course in Chemistry German is required, while both French and German are necessary for the degree in "Mathematics and Physics."

ACADEMIC COURSE.

The following Academic Course of study was established in pursuance of an act of the Legislature of Missouri, in 1885. It is designed to make the course equal in every respect to those offered at the best academies. As now arranged, it will commend itself especially to young men who wish to fit themselves for successful business or professional life, and to teachers who wish to prepare for higher work in their calling. The completion of the first year of this course admits the student to any of the professional courses without examination. A Diploma of Graduation will be granted to students who complete the course:

First Year.

<i>First Semester.</i>		<i>Second Semester.</i>	
Higher Arithmetic	5	Higher Arithmetic	5
Elementary Algebra	5	Elementary Algebra	5
American History	5	Physiology and Hygiene	3
English Grammar	5	Composition and Rhetoric	5

Second Year.

General History	5	General History	5
German	5	Civil Government	5
Geometry (Plane)	4	German	5
Zoology	5	Geometry (Solid)	4

Third Year.

English and American Literature	3	English and American Literature	3
Higher Algebra	5	Higher Algebra	5
German	3	German	3
Elementary Physics	3	Elementary Chemistry	3

Fourth Year.

Psychology	2	Logic	2
Physical Geography	2	Descriptive Astronomy	2
Trigonometry	5	Book-keeping (optional)	2
English History	5	Political Economy	5
		Botany	5

GENERAL INFORMATION.

BUILDINGS AND EQUIPMENTS.

The buildings of the School of Mines are situated in the most elevated part of the city of Rolla. They are substantial brick structures, well ventilated and lighted, and heated by the best furnaces manufactured. The main building has recently been painted and kalsomined throughout, and the laboratory, one of the most complete in the country, has been in use but six years.

The different departments of the School are well supplied with apparatus. Several hundred dollars have been expended this year in the purchase of instruments and apparatus for the departments of Engineering, Chemistry and Physics, and further purchases will be made as additional needs are felt and financial condition of the School will allow.

The students' club-house, or dormitory, built in 1890, contains commodious and comfortable rooms for thirty young men. Two students occupy one room. The dining hall and culinary department can accommodate sixty. This year the students pay \$12 a month for board in the club-house. Whenever they shall deem it desirable, the students will be allowed to form themselves into a club and employ their own caterer. In this manner it is believed that they will be able to board themselves at comparatively low cost.

Students wishing to engage rooms in the club building for next year should do so before September 1, as the supply of rooms may be exhausted. To engage a room a deposit of \$5 is required as an earnest of good faith on the part of the student. This money will be refunded at the opening of the school whether the student take the room or not.

EXPENSES.

A matriculation fee of \$10, payable on entrance, and a library fee of \$2 a semester, payable on the first day of each semester, are required of every student.

All laboratory students furnish their own blowpipes, platinum, silver and gold solutions, crucibles and apparatus, and pay for gas and fuel consumed and for apparatus damaged or destroyed. A deposit of \$5 per semester, covering the value of the apparatus and chemicals issued, is required to be placed in the hands of the Treasurer by each laboratory student. This deposit, less the value of material consumed, is returned at the close of the year.

Board, including fuel, lights, washing, etc., can be obtained for \$12 to \$15 a month. The necessary expenses for the year are as follows:

	Moderate.	Ample.
Matriculation fee.....	\$10 00	\$10 00
Library fee.....	4 00	4 00
Books, stationery and chemicals.....	15 00	25 00
Board, fuel, lights, washing, etc.....	96 00	135 00
Total.....	\$125 00	\$174 00

LIBRARY.

The library contains 3000 volumes. Extensive works upon Engineering, Mathematics, Chemistry, Physics, Assaying and Metallurgy afford to all students in these departments an excellent opportunity to pursue an extended course of reading in connection with their class work. The library also contains the standard works in English and American poetry, fiction, biography and history, provided with especial view to the needs of Academic students. The following periodicals for the current year are found on the reading tables of the library:

American Chemical Journal.
 American Journal of Science.
 American Journal of Mathematics.
 Annals of Mathematics.
 Century Magazine.
 Chemical News.
 Electrical World.
 Engineering Magazine.
 Engineering News.
 Engineering and Mining Journal.
 Forum.
 Harper's Monthly.
 Harper's Weekly.
 Public Opinion
 Puck.
 Railroad and Engineering Journal.
 Science

Journal of Analytical and App. Chemistry.
 Judge.
 Ladies' Home Journal
 Leslie's Illustrated Weekly.
 Life.
 Literary Digest.
 Lippincott
 Nature.
 Nation.
 North American Review.
 Philosophical Review
 Popular Science Monthly.
 Popular Science News.
 Scribner's Magazine.
 Scientific American.
 Scientific American Supplement.

The library is open daily from 8 a. m. to 4 p. m. Books may be taken out by the students under certain regulations.

ATHLETICS.

Through the liberality of the Carators an athletic field has been enclosed and graded for the benefit of the students. It furnishes ample space for base-ball, foot-ball and lawn tennis. An athletic association exists among the students, and it is hoped that means will soon be provided for the erection of a gymnasium.

LITERARY SOCIETIES.

Two literary societies were organized during the year—the Philo Literary society by the young men and the Alpha club by the young women of the school. The “Alpha” meets every Saturday afternoon and the “Philo” every Saturday evening for improvement in debate, oratory and composition.

EXAMINATIONS.

During the last week of each semester all students are required to stand written examinations on the studies pursued, and the results of these examinations, with the average monthly grades, determine their semester grades. A student, to pass, must attain at least 75 per cent.

MONTHLY REPORTS.

Regular monthly reports are sent to the parents or guardians of each student, showing the student's grade in scholarship for the month, and giving such other information in regard to his progress, attendance, etc., as may be thought to be of interest. The attention of parents and guardians is particularly called to these reports.

DEGREES.

UNTITLED DEGREES.

1. A Certificate of Proficiency is conferred on one who has attained the required standard in all work in any of the following special courses: Geology and Mineralogy, General Chemistry, Fire Assaying, Botany and Zoology, Physics, Geodesy.

2. A Diploma of Graduation is conferred on one who has passed in any of the following departments: Mathematics, Physics, Analytical Chemistry, Engineering, and the Academic course.

SCIENTIFIC DEGREES WITH TITLES.

1. The degree of Bachelor of Science in Mathematics and Physics is conferred upon one who has passed examinations on all the subjects of instruction in the course of Mathematics and Physics.

2. The degree of Bachelor of Science in Chemistry is conferred on one who has passed examinations on all of the work of the special Chemical course.

PROFESSIONAL DEGREES WITH TITLES.

1. The degree of Bachelor of Science in Civil, Mining or Mathematical Engineering, respectively, is conferred on one who has passed examinations on all of the subjects of instruction in the Civil, Mining, Mechanical Engineering Course, respectively.

2. The degree of Civil, Mining or Mechanical Engineer is conferred on one who, having graduated in Civil, Mining or Mechanical Engineering and received the Bachelor's degree therein, has identified himself with the profession during a period of not less than three years, and during that time has demonstrated by work his fitness for his chosen profession.

COMMENCEMENT.

The annual Commencement exercises are held in the Assembly room, at the close of the work in June. The exercises consist of an address by some prominent speaker, the conferring of the degrees and granting of diplomas by the Director, and the reading of abstracts of their theses by members of the graduating class.

At the Commencement exercises on Thursday, June 9, 1892, the address was delivered by Dr. R. H. Jesse, President of the University.

The following is a list of the Graduates and the degrees conferred:

GRADUATES.

Mining Engineering, F. A. Jones.

Civil Engineering, F. A. Jones, F. L. Tyrrell.

Analytic Chemistry, D. C. Jackling, F. A. Jones.

Assaying, D. C. Jackling.

DEGREES.

Bachelor of Science (in Chemistry), D. C. Jackling, E. M. Johnson.

Civil Engineer, F. A. Jones, F. L. Tyrrell.

Mining Engineer, F. A. Jones.

LIST OF STUDENTS.

ACADEMIC STUDENTS.

Name.	Postoffice.	County.
<i>GRADUATES.</i>		
Brown, Geo. L.	Reynard	Ba'es
Conley, Milton R.	Columbia	Boore
Early, Leslie N.	Huntsville	Randolph
Fellows, John N.	Weston	Platte
Johnston, Eva.	Columbia	Boone
Skaggs, Wm. Leslie.	DeSoto	Jefferson
Williams, Frank B.	Warrensburg	Johnson
-7		
<i>UNDER-GRADUATES.</i>		
<i>SENIOR CLASS.</i>		
Adams, Jennie	Shelbina	Shelby
Anthony, Francis R.	Maryville	Nodaway
Asendorf, Geo. Wm. H.	Craig	Holt
Beach, Emory V.	Helena, Mont.	Chariton
Buffington, Samuel A.	Salisbury	Andrew
Debord, King	Fillmore	Cole
Hanszen, Lydia	Jefferson City.	Chariton
Hodge, Robt. J.	Brunswick	Franklin
Kiehl, Herman G.	Beemont	Chariton
Meyer, Jesse	Salisbury	Boone
Pettingill, Minnie.	Centralia	"
Westlake, Ruby M.	Midway	"
Westlake, Nancy P.	"	"
Wilkinson, Jno. W.	Columbia	"
Zillman, C. C. H.	Indian Grove ..	Chariton ..
-15		
<i>JUNIOR CLASS.</i>		
*Adams, Vinnie	Shelbina	Shelby
*Beazley, Geo. H.	Columbia	Boone
*Conley, Wm. Thos.	"	"
Gaines, Chas. L.	Marshall	Saline
Gerig, Ida	Columbia	Boore
Goslin, Benj. F.	Hinton	"
Harris, Herman F.	Columbia	"
*Kahn, Otillie.	Brookfield.	Linn
*Leaver, Florence N.	Chillicothe	Livingston
*McCulloch, Albert J.	Pisgah	Cooper
*Riggs, Inez	Curryville	Pike
Shaefer, Jean A.	Columbia	Boone
*Wade, Jno. F.	Bolckow	Andrew
*Wettack, Elmer E.	Marshall	Saline
*Wettack, Jno. A.	"	"
-15		
<i>SOPHOMORE CLASS.</i>		
*Allen, Edward T.	Columbia	Boone
*Almstedt, Herman B.	St Charles	St Charles
Barnett, Mary Jessie.	Columbia	Boone
*Beauchamp, Clara L.	California	Moniteau
*Botts, Wm. Ford.	Kansas City	Jackson
*Broachhead, Garland C.	Columbia	Boone
*Cooper, James W.	"	"
*Evans, Geo. A.	Carthage	Jasper
*Ficklin, Walter H.	Columbia	Boone

*Students whose names are marked with a star have work below the class in which their names appear.

Name.	Postoffice.	County.
*Gudgell, Frank O.	Independence.	Jackson
Haydon, Curdis	Deer Park	Boone
Stampft, Geo. J.	Jefferson City.	Cole
Stone, Kimbrough	Nevada	Vernon
*Wilkerson, Geo. R.	Sedalia	Pettis
*Williams, David E.	Conway	Laclede

—15

FRESHMAN CLASS.

Barnett, Bruce	Sedalia	Pettis
Barnett, Jas. S.	Columbia	Boone
Boyer, Jno. S.	Easton	Buchanan
*Bush, Chas. A.	Centralia	Boone
*Byers, Chas. E.	St. Louis	
Caskie, Jno. J. K.	Boonville	Cooper
Cogrove, Jas. W.	Jefferson City.	Cole
*Crafton, Minnie	Centralia.	Boone
*Creason, Goodwin	Mexico	Audrain
Crossley, Wallace	Sheldon	Vernon
*Davis, Geo. T.	Washington.	Franklin
*Detweiler, Andrew J.	Hopkins	Nodaway
*Dungan, Harry M.	Salem.	Dent
*Fischer, Oscar E.	California	Moniteau
*Gordon, Chas. M.	Edgerton	Platte
*Gustin, Charles	Sprague	Bates
*Gwinn, Arthur	Bethany	Harrison
*Harrison, Cora		
*Harrison, Grace	Mexico.	Audrain
Hinde, Wm. H.	Higginsville	Lafayette
*Kuehs, Jos.	Blackburn	Saline
*Major, John Wm. McG.	Molino	Audrain
*Marshall L. J.	St. Louis	
*Massengale, Jas. R.	Macon City	Macon
*Matthews, Orlow B.		
*Matthews, Otto F.	Bunker Hill.	Lewis
*McCutchan, Ella B.	"	"
*McCutchan, Ignatius	"	"
*McCutchan, Joseph	"	"
*Moore, Washington	"	"
*Oldham, Silas E.	Columbia	Boone
*Pearson, Albert McA.	Kansas City	Jackson
*Perrin, Clark		
Pollard, Janie E.	Columbia	Boone
*Robertson, Wm. W.	Norborne	Carroll
*Rogers, Jno. S.	Palmyra	Marion
*Rosenthal, Rosa	Slater	Saline
*Rothwell, Rolla R.	Moberly	Randolph
*Strong, Chas. M.	Hoover	Vernon
*Sutherland, Virginia	Houston	Texas
*Tannehill, Maud E.	Clinton	Henry
*Taylor, Earl M.	California	Moniteau
*Taylor, Jas. W.	Fairfield, Ill.	
*Thompson, Benj. Lee	Pendleton	Warren
*Tyree, Cora L.	Carthage	Jasper
*Vallier, Jas.	Leonard	Shelby
*Vaughan, Clara L.	Slater	Saline
*Westbrook, Jno. C.	A-hland	Boone
*Wood, Jno. H.	Strother	Monroe
*Wood, Walter F.	Calif. rnia	Moniteau
*Young, Wm. C.	Nevada	Vernon

—51

PREPARATORY CLASS.

Adams, Arthur N.	Buckner	Jackson
Adams, Geo. P.	King City	Gentry
Adams, Mary E.	Columbia	Boone
Adams, Thos. B.	Norborne	Carroll
Allee, Gail D.	Olean	Miller
Allen, Marv S.	Columbia	Boone
Anderson, Sam'l J.	"	"
Baker, Hugh E.	"	"
Barnes, Chas. M.	"	"
Barth, Irvin V.	New Madrid	New Madrid
Bateman, Jesse O.	Columbia	Boone
Bazley, Arthur P.	"	"
Blackwell, Laura C.	"	"
Blanton, David A.	"	"
Blarton, Martha B.	"	"
Booth, Jno. N.	Shackelford	Saline
Botts, McDowell	Kansas City	Jackson

*Students whose names are marked with a star have work below the class in which their names appear.

Name.	Postoffice	County.
Bright, Jno. McK.	Columbia	Boone
Broadhead, Marion G.	"	"
Burcham, Emma D.	"	"
Campbell, Henry R.	"	"
Chowling, Orville	Madison	Monroe
Coffman, Harry L.	Commerce	Scott
Coleman, Augustus C.	Columbia	Boone
Coleman, Robt. L.	"	"
Combs, Clark W.	Leavenworth, Ks.	
Conley, Dudley S.	Columbia	Boone
Cooper, Ole Chas.	Monndville	Vernon
Corner, Albert W.	Worcester	Andrain
Creason, Benj. F.	Centralia	Boone
Donnohue, Bell D.	Columbia	"
Duncan, Clark B.	Olney	Lincoln
Dunn, Wm. V.	Bethany	Harrison
Dysart, Martha C.	Columbia	Boone
East, Chas. W.	Troy	Lincoln
Edwards, Arthur C.	Jefferson City	Cole
Estes, B.keley	Columbia	Boone
Fewsmith, Stella	"	"
Fischer, Chas. A.	Dora	Ozark
Fosher, Manassah E.	Leverton	Linn
Gerig, Jno. G.	Columbia	Boone
Grayson, Conway	Grayson	Clinton
Hall, Chas. R.	Harrisonville	Cass
Hall, Mary L.	Bedford	Livingston
Haymes, J. E.	Conklin	Webster
Henderson, Cicero	Strother	Monroe
Hendrick, Ernest	Bowling Green	Pike
Higginbotham, Levi S.	Louisville	Lincoln
Hilt, Samuel W.	Buckner	Jackson
Hummel, Ellis	Prosperity	Jasper
Jacks, Harry S.	Montgomery City	Montgomery
Jacobs, Wm. T.	Eolia	Pike
Jennings, J. R.	Columbia	Boone
Jennings, Wm. O.	"	"
Johnson, Frank L.	"	"
King, Roy	Linn Creek	Camden
Lane, Chas. W.	Midway	Boone
Lanning, Jno. H.	Ste. Genevieve	Ste. Genevieve
Leavenworth, Geo.	Greenville, Miss.	
Leonard, Jas. L.	Pleasant Hill	Cass
Marshall, Archie M.	Mollro	Andrain
Maupin, Robt. E.	Maud	Shelby
Maxwell, Emmett	Millersburg	Callaway
Maxwell, Wm. Robt.		
McAtester, Andrew	Columbia	Boone
McClane, Jean E.	"	"
McComas, Edwin G.	Sturgeon	"
Miller, Wm. A.	Rochepoit	"
Mitchell, Robt. E.	Columbia	"
Monser, Frank	"	"
Morris, Marvin O.	Gray's Point	Lawrence
O'Mahoney, Lafayette	Columbia	Boone
Palmer, Wilmot C.	Points	"
Pannell, Geo. H.	Columbia	"
Parmer, Chas. C.	"	"
Peeler, Chas. F.	White's Store	Howard
Peery, Wm. E.	Brunswick	Chariton
Perdue, Jno. H.	Sedalia	Pettis
Phillips, Jno. H.	Dripping Spr'gs.	Boone
Pickett, Levi E.	Galt	Grady
Pollard, Chas. B.	Eolia	Pike
Powell, Bessie	Columbia	Boone
Powers, Lewis T.	Young's Creek	Andrain
Ramey, Sam'l J.	Berlin	Gentry
Rhodes, Walter R.	Mosby	Clay
Robbins, Jas. K.	New Madrid	New Madrid
Robinson, Clark	Deer Park	Boone
Scott, Thos.	Ashland	
Sexton, Floyd	Millersburg	Callaway
Sims, Jno. H.	Hazen, Ark.	
Starks, Jno. C.	Gower	Clinton
Stephens, Hugh M.	Columbia	Boone
Switzler, Royal H.	"	"
Talpey, Jas. R.	Knob Noster	Johnson
Taylor, Joshua B.	Palmyra	Marion
Terrill, Cora C.	Farcett	Buchanan
Thomas, Thomas	Edgerton	Platte

Name.	Postoffice.	County.
Thompson, Edgar S.	Brown's Station	Boone
Thompson, Frank F.	Belle Fonte	Pulaski
Thompson, Guy A.	Columbia	Boone
Thompson, Geo. E.	"	"
Tyree, Jesse	Carthage	Jasper
Vance, Jas. Wm.	Fairfield	Benton
Walker, Nellie	St. Joseph	Buchanan
Westlake, Jas. E.	Huntsville	Randolph
Wiatt, Wm. S.	Cyrene	Pike
Wilhite, Jos. V.	Oxford	Worth
Willoughby, Claude	Tamaroa, Ill.	
Wilson, Frank L.	Louisville	Lincoln
Wilson, Walter W.	Shawnee Mound	Henry
Young, Fred	Columbia	Boone
Zick, Bernard	Pleasant Hill	Cass

-112

SPECIAL STUDENTS.

Barnett, Geo. Harlem	Columbia	Boone
Barnett, Sentiny R.	"	"
Bahr, Sam'l W.	"	"
Botts, Francis V.	Molino	Audrain
Brooks, Orphred H.	Montgom'y City	Montgomery
Caldwell, Charles W.	Slater	Saline
Cauthorn, Louisa L.	Columbia	Boone
Campbell, Eula G.	"	"
Craig, Sam'l O.	Cyrene	Pike
Dalton, Jno. D.	Saverton	Ralls
Davidson, Jas. H.	Little Rock	Saline
Dodson, Anna W.	Columbia	Boone
Downing, Rob't E.	"	"
Edwards, Granville D.	"	"
Ellis, Jno. Lee	"	"
Eppes, Thos. J.	"	"
Evans, Ivy Ella	N. Kansas City	Clay
Freeze, Edwin	Dadeville	Dade
Griffith, Angie R.	Chillicothe	Livingston
Griffith, Wm. W.	"	"
Guitar, Odon	Columbia	Boone
Guthrie, Rob't M.	Josephville	St. Charles
Hall, Jennie L.	Bedford	Livingston
Hernleben, Henry	Jamestown	Moniteau
Houston, Jno. C.	Hallsville	Boone
Huston, Arthur E.	Marshall	Saline
Hutchinson, Frank P.	Jamesport	Daviess
Hutchison, Sam'l M.	Shelbyville	Shelby
Ingrum, Linnie	Belton	Cass
Jacobs, Chas. C.	Columbia	Boone
Jarvis, Robert E.	Moberly	Randolph
Kemp, Geo. Ward	Salida, Colo.	"
Long, Laura V.	Columbia	Boone
Lynch, Dora A.	Edwardsville, Ill.	"
Manning, Jno. F.	McFall	Gentry
Mason, Louis S.	Mexico	Audrain
Mav, Robert A.	Wentzville	St. Charles
McNeely, Jno. D.	St. Joseph	Buchanan
Mc-versieck, V. E.	Union	Franklin
Mikel, Henry F.	Columbia	Boone
Morrow, Wm. C.	Viola	Stone
Murry, Harvey D.	Stephens' Store	Callaway
Norfleet, Viola	High Point	Moniteau
O'Hearn, Jno. R.	Slater	Saline
Phillips, Geo. B.	Dripping Sprgs	Boone
Price, Stuart R.	Plattsburg	Clinton
Riggs, Norman C.	Farmer	Pike
Rowell, Frank D.	Ekron, Ky.	"
Shafer, Arthur B.	Nevada	Vernon
Shickles, Jno. R.	Enon	Moniteau
Smith, Camille	Columbia	Boone
Smith, Chas. E.	"	"
Smith, Jno. B.	"	"
Stannoff, Geo. J.	Kansas City	Jackson
Turner, Edwin	Jefferson City	Cole
Warren, Earle	Columbia	Boone
Wheeler, Claude M.	Ionla City	Pettis
Wickham, Frank D.	Norborne	Carroll
Wilhite, Osc. r C.	Jefferson City	Cole
Williams, Calvin W.	Grant City	Worth
Wood, David P.	Pearl	Greene
	Platte City	Platte

-61

Name.	Postoffice.	County.
STUDENTS IN COLLEGE OF AGRICULTURE.		
(Students taking the full course of study.)		
Baker, Joseph Glenn	Thompson	Audrain
Barnett, Sentiny R.	Columbia	Boone
Beasley, Montie L.		
Bretz, Wm. Shull	Frazier	Buchanan
Bulla, Julian	Empire Prairie	Andrew
Chubbuck, Winthrop P.	Kidder	Caldwell
Conley, Abraham H.	Columbia	Boone
Conger, Geo. C.		
Conover, Chas. C.	Peculiar	Cass
Daniel, Geo. E.	Thompson	Audrain
Farley, Louis R.	Columbia	Boone
Goodwin, Robt. C.	Warren	Marion
Guitar, Odon Jr.	Columbia	Boone
Hickman, Thos. B.	"	"
Huber, Chas.	Westphalia	Osage
Jacobs, Chas. C.	Columbia	Boone
Knox, Hen y M.	Omaha, Neb	
Lillard, Alonzo	Carrington	Callaway
Lillard, Doshia		
May, D. W.	Warrensburg	Johnson
Moore, Washington R.	Bunker Hill	Lewis
Norfleet, Robt. A.	High Point	Moniteau
Sears, Alonz J.	Barrett	Morgan
Siersdorfer, R. Wm.	Kansas City	Jackson
Weeks, Edwin C.	Eldon	Miller
Woodruff, Robt L.	Orrick	Ray
Wyatt, Marquis W.	Rockport	Atchison
—27—		
<i>Special Students from other Departments Taking One or More Studies in this College</i>		
Alsapau, Stella	Columbia	Boone
Adams, Arthur N.	Buckner	Jackson
Baker, Hugh E.	Columbia	Boone
Baender, Chas L.	Moberly	Randolph
Bautzer, Edw H.	Chamois	Osage
Bright, Jno. McK.	Columbia	Boone
Bear, Hugh M.	Tipton	Moniteau
Browning, H. M.		
Brown, Emma M.	Brown's Station	Boone
Burnham, Nannie	Columbia	"
Burnham, Sallie	"	"
Baumgartner, Georgie	"	"
Brock-nbrough, Mary	"	"
Buhr, Samuel W.	"	"
Burgess, Elijah	DeSoto	Jefferson
Berkebile, Aletha L.	Columbia	Boone
Brace, Penn	Jefferson City	Cole
Bashaw, Wm. M.	Columbia	Boone
Burnham, Edna	Dripping Spr'gs.	
Balthis, F S.	Huntsville	Randolph
Craig, Sam'l O.	Cyrene	Pike
Corner, Albert Watson	Worcester	Audrain
Cauthorn, Ed. B.	Columbia	Boone
Carter, Jas. M.	Worcester	Audrain
Cope, A. Nathan	Kingston	Caldwell
Crecelius, Harry A.	Mehlville	St. Louis
Davie, Wm. Ford	St. Louis	
Doty, A H.	Jamesport	Davless
Dunham, Albert	Bewler	Macon
Duncan, Clark	Olney	Lincoln
Edwards, Granville D.	Columbia	Boone
Furtney, Chas. W.	Trenton	Grundy
Fyter, Jno. K.	Columbia	Boone
Fowler, Harry G.	Chillicothe	Livingston
Fowler, Thos R.	Sedalia	Pettis
Gerling, August	Columbia	Boone
Guitar, Odon Jr.	"	"
Grayson, Conway	Grayson	Clinton
Hodge, Robt. W.	Brunswick	Chariton
Highley, Lee	Farmington	St. Francois
Jackson, Nathaniel D.	Independence	Jackson
Kinney, Noble W.	Boonville	Cooper
Lacof, Leo F.	Nevada	Vernon
Lockwood, Frank Levy	Rockport	Atchison
Lotter, Harry H.	Moberly	Randolph

Name.	Postoffice.	County.
Lawrence, Alonzo W	Bowling Green.	Pike
Mikel, Henry F	Columbia	Boone
Mason, Elliot J	Mexico	Andrain
Manly, Chas M	Greenville, S. C.	
McCrary, Willard L	Eldorado Sp'gs	Cedar
McAlester, Edgar	Columbia	Boone
Mockler, Chas R	Horine	Jefferson
Newman, Roy F	Columbia	Boone
Peake, Geo R	Kansas City	Jackson
Parker, Pascal	Jefferson City	Cole
Renoe, Chas F	Guthrie	Callaway
Roper, Wm. H	Nichols	Greene
Rhett, Albert	Baltimore, Md.	
Rothwell, Rolla R	Moberly	Randolph
Stayton, E. M	Kansas City	Jackson
Sliger, Winfred E	Phelps City	Atchison
Shawhan, Thos. R.	Lone Jack	Jackson
Skelly, Jas W	Mexico	Andrain
Shipman, Robt. L	Holden	Johnson
Small, Frank J	Trenton	Grundy
Seymour, W. T	Surgeon	Boone
Thompson, J. D	Mound City	Holt
Todd, Ben	Columbia	Boone
Thompson, Thos. W	Pendleton	Warren
Veach, S J	Columbia	Boone
Warren, Earl	Ionia City	Pettis

-71

NORMAL STUDENTS.

Alsau, Stella P.	Columbia	Boone
Bautzer, Edward H	Chamois	Osage
Bear, Hugh M	Tipton	Moniteau
Berkebile, Aletha L	Brown's Station	Boone
Boman, Jno S	Roads	Carroll
Borrow, Jno A	Rich Hill	Bates
Brown, Emma M	Dripping Spr'gs.	Boone
Browning, Oliver P	Molino	Andrain
Burnham, Nannie	Columbia	Boone
Burnham, Sallie E	"	"
Calvin, Robt. L	Grant City	Worth
Coil, Jas H	Perry	Ralls
Daily, Bessie	Columbia	Boone
Dowell, Jas R	Eaton, Ky	
Dysart, Maria	Brown Station	Boone
Eckley, Katie R	Stephens Store	Callaway
Edwards, Mitchell M	Hamilton	Caldwell
Fewsmith, Joy	Columbia	Boone
Flynt, Wm R	Points	"
Fulton, Arthur L	Harrisonville	Cass
Gillaspie, Wm A	Columbia	Boone
Goldsberry, Willard	Dripping Spr'gs.	"
Hall, Sallie A	Columbia	Boone
Hamilton, Ed R	"	"
Hodge, Robt. W	Brunswick	Chariton
Holman, Jurney H	Hartford	Putnam
Laws, Lena	Columbia	Boone
Mahan, Maria L		"
Martin, Howard S	Lancaster	Schuyler
Meyer, Jesse	Salisbury	Chariton
Northcutt, Lewis	Saverton	Ralls
Pauley, Anna L	Columbia	Boone
Peeler, Geo. K	Rockville	Rates
Powell, Herman C	Columbia	Boone
Renoe, Chas. F	Guthrie	Callaway
Richards, Alice M	Columbia	Boone
Riehl, Mav	Potosi	Washington
Riggs, Nellie May	Bowling Green	Pike
Rouner, Ashby W	Newark	Knox
Schwabe, Rachel L	Columbia	Boone
Steele, Asa G	Wellsville	Montgomery
Stewart, Florence	Columbia	Boone
Strickler, Kate	Freeman	Cass
Strickler, Nana	"	"
Thurston, Hollis H	Woodlarkville	Boone
Waugh, Roberta M	Rothwell	Chariton
Wiatt, Wm. S	Cyrene	Pike
Wilkinson, Jno. W	Columbia	Boone
Wilkinson, Eugene A	"	"
Zillman, Christian C. H.	Indian Grove	Chariton

-50

Name.	Postoffice.	County.
<i>Teachers' Course.</i>		
Barnes, Henry J.	Avalon	Livingston
Bedford, Sudie	Rowena	Andrain
Byrd, Thos. S.	Hematite	Jefferson
Cahall, Addie	Wellsville	Montgomery
Condict, Wayne E.	Lamar	Barton
Conran, Jas. F.	Columbia	Boone
Corlew, Maggie	"	"
Daily, Rosa A.	"	"
Denham, Fannie	Mount Zion	Henry
Denham, Lulu Alice	"	"
Eldridge, Jas.	Sullivan	Franklin
Fluesmleir, Emily S.	Schluersburg	St. Charles
Fluesmleir, Elvira L.	"	"
Gregg, Dillie I.	Wyconda	Clark
Heisler, Mary	Columbia	Boone
Hofseas, Jno. Wm.	Benton City	Andrain
Horning, Clotilda	Springfield	Greene
Harrington, Edward C.	"	"
Houston, Jas. M.	Raymore	Cass
Kasel, Aug. Chas.	Dundee	Franklin
Klein-George, Wm. F.	Hotwell	"
Marshall, Nobia	Renick	Randolph
Murray, Nettie	Br. wn's Station	Boone
Oldham, William A.	Bosworth	Carroll
O'Rear, Meranda	Centralia	Boone
Patterson, Edwin S.	Young's Creek	Andrain
Thomas, Evalina	Camden Point	Platte
Todd, Mary	Shelbyville	Shelby
Sampson, Margaret F.	Columbia	Boone
Speer, Edward Jas.	Fairmont	Clark
Wilcox, Hattie	Wyconda	"
Wilbite, Anna Z.	Oxford	Worth
Whiffin, Harry H.	Kansas City	Jackson
Walker, Robt. Lee	Nevada	Vernon
		-34
<i>LAW STUDENTS.</i>		
<i>GRADUATE CLASS.</i>		
Randolph, Wm. F.	Wellsville	Montgomery
Truitt, Wm. H.	Columbia	Boone
		-2
<i>SENIOR CLASS.</i>		
Barr, Guy C.	St. Joseph	Buchanan
Beach, Emory V.	Helena, Mont.	"
Blackwell, Wm. F.	Pattonville	St. Louis
Bond, Samuel W.	St. Marys	Ste. Genevieve
Botts, Hosea T.	Novelty	Knox
Corum, Chas. D.	Boonville	Cooper
Cravens, Wm. B.	Fort Smith, Ark.	"
Davis, Sidney E.	St. Louis	"
Dempsey, Luther N.	Rothville	Chariton
Ellis, Chas. M.	Hermann	Gasconade
Felker, Henry C.	Vienna	Marion
Goodrich, Jno. E.	Cameron	Clinton
Groves, Hiram J.	Dover	Lafayette
Holmes, Albert S.	Hannibal	Marion
Loeb, Isador.	Columbia	Boone
McCurdy, Geo. V.	Sedalia	Pettis
Murry, Jerry H.	McCreedie	Callaway
Ray, Fred P.	Kansas City	Jackson
Sparrow, Wm. S.	Vandalia	Andrain
Strother, Samuel B.	Kansas City	Jackson
Swarner, Wm. H.	Clarksburg	Moniteau
Timberlake, Estill M.	Warren	Marion
Williams, Joseph G.	Hillsboro	Jefferson
		-23
<i>JUNIOR CLASS.</i>		
Burton, Wm. E.	Bourbon	Crawford
Beckers, Casper H. L.	Normandy	S. Louis
Bury, Albert S. J.	Edgerton	Platte
Brace, Penn	Jefferson City	Cole
Buffington, Samuel A.	Salisbury	Chariton
Byrd, Richie L.	Hematite	Jefferson
Coil, James N.	Nevada	Vernon
Collins, Zenas S.	Smithville	Clay
Coons, James H.	Palmyra	Marion

Name.	Postoffice.	County.
Cooper, Charles Mason	Morley	Scott
Gerling, Henry J.	Columbia	Boone
Granger, Orin W.	St. Louis	
Gross, Charles	Lawson	Ray
Harn, William L.	Columbia	Boone
Hinsley, Walter L.	Jarvis	Jefferson
King, Melville S.	Lake City, Ia.	
Latimer, Chas. W.	Independence	Jackson
Meigs, Wellington H.	Siloam Spr., Ark	
Nelson, Thomas L.	Cappingler's M	Cedar
Niedermeyer, Fred. W.	St. Louis	
Smith, James LeRoy	Kansas City	Jackson
Poland, Joseph R.	Round Grove	Lawrence
Thomas, Nathan C.	Pearl	Greene
Thurman, Anderson W.	Rich Hill	Bates
Turner, Kirk B.	Columbia	Boone
Walker, Harry B.	Skidmore	Nodaway
White, James P.	Fayette	Howard
Wilkson, Charles P.	Bonne Terre	St. Francois

-28

SPECIAL CLASS.

Crook, L. E.	Roscoe	St. Clair
Gerig, Edward	Columbia	Boone
Lane, Thomas F.	Poplar Bluff	Butler
Shouse, Paul	Columbia	Boone

-4

MEDICAL STUDENTS

Allen, Wm. Wright	Middle Grove	Monroe
Angel, Wm. E.	Rocheport	Boone
Baker, Charles M.	Paris	Monroe
Belden, Wm. Everett	Columbia	Boone
Blakely, Wm. A.	Mendon	Chariton
Briegleb, Charles F.	St. Clair	Franklin
Cook, Richard F.	Centralia	Boone
Downing, S. W.	"	"
Ferguson, John Porter	Ft. Worth, Texas	"
Graham, Robert Emmett	Clarks, Ohio	"
Green, David Elisha	Platte City	Platte
Hofner, Ernest Louis	Hermann	Gasconade
Hunter, Wilbur Clinton	Trenton	Grundy
Jordon, James Ernest	Hinton	Boone
Kurtz, Daniel Webster	Columbia	"
Locker, George Everett	Duval	Barton
Lockwood, Wm. Duncan	Rockport	Aichison
McCullah, Willis Austin	Marion	Cole
McClane, Otto N.	Columbia	Boone
McGuire, Morris	"	"
McQuitty, James Wm.	Midway	"
Newman, Caro Warder	Columbia	"
Parmer, John Elvin	"	"
Quinn, Abram Turner	"	"
Reed, Orson Davis	Tulip	Monroe
Rutherford, Henry H.	Fort Smith, Ark	"
Shaffer, Harry Irving	Dallas, Texas	Boone
Shaffer, Wm. Rothwell	Columbia	Boone
Shrader, Eugene Wesley	Paris	Monroe
Smith, August	Hermann	Gasconade
Smith, H. C.	Sedalia	Pettis
Steele, Wm. Arthur	Wellsville	Montgomery
Taylor, Arthur G.	Prairie Home	Cooper
Thornton, Joseph E.	Rocheport	Boone
Treadway, Oscar Herbert	Paynesville	Pike
Truitt, Samuel Watson	Millersburg	Callaway
Turner, George Samuel	Columbia	Boone
Young, Melvin Meredith	Marshall	Saline
Wade, Fernando Harding	Columbia	Boone

-39

ENGINEERING STUDENTS.

Baender, C. L.	Moberly	Randolph
Balthis, F. L.	Huntsville	"
Bashaw, W. M.	Columbia	Boone
Carter, J. M.	Worcester	Adair
Canthorn, E. B.	Columbia	Boone
Cope, A. N.	Kingston	Caldwell
Crecelius, H. A.	Mehville	St. Louis
Davie, W. F.	St. Louis	"
Davie, W. E.	Pt. Pleasant	New Madrid
Dinsmore, G.	Kirksville	Adair

Name.	Postoffice.	County.
Doty, A. H.	Jamesport	Daviess
Dunham, A.	Bevier.	Macon
Fowler, H. G.	Chillicothe	Livingston
Fowler, T. R.	Sedalia	Pettis
Furtney, C. W.	Trenton	Grundy
Fyfer, J. K.	Columbia	Boone
Garrett, R. P.	Mound City	Holt
Gerling, A.	Columbia	Boone
Griggs, A. B.	Hedge City	Knox
Hickman, T. H.	Columbia	Boone
Highley, Lee	Farmington	St. Francois
Jackson, N. D.	Independence	Jackson
Joy, F. E.	Ravenwood	Nodaway
Lawrence, A. W.	Bowling Green	Pike
Lockwood, F. L.	Rockport	Atchison
Lockwood, M. H.	"	"
Lyman, R. E.	Columbia	Boone
Lotter, M. E.	Moberly	Randolph
Lynch, W. G.	Shackelford	Saline
Manly, C. M.	Greenville, S. C.	"
Mason, E. J.	Mexico	Audrain
Mayer, E. M.	St. Joseph	Buchanan
McAlester, E.	Columbia	Boone
McCrary, W. L.	Eldorado Spr'gs	Cedar
Merriwether, J. D.	Aberdeen	Pike
Metcalf, Thos	Maitland	Holt
Miller, G. E.	Weldon Springs	St. Charles
Mockbee, C. R.	Horine	Jefferson
Moore, Robt.	Linneus	Linn
Noggle, J. R.	Unionville	Putnam
Parker, P.	Kansas City	Jackson
Peake, G. R.	"	"
Pratt, J. K.	Columbia	Boone
Rhett, A.	Baltimore, Md.	"
Robinson, E. W.	San Antonio, Tex	"
Roper, W. H.	Nichols	Greene
Rucker, R. F.	Avenue City	Andrew
Seymour, W. H.	Sturgeon	Boone
Sanders, J. L.	Memphis	Scotland
Shawhan, D. L.	Lone Jack	Jackson
Shawhan, T. R.	"	"
Shipman, R. L.	Holden	Johnson
Skelly, J. W.	Mexico	Audrain
Sliger, W. E.	Phelps City	Atchison
Small, F. J.	Trenton	Grundy
Stayton, E. D.	Independence	Jackson
Truitt, C.	Columbia	Boone
Thompson, T. W.	Pendleton	Warren
Thompson, J. D.	Mound City	Holt
Uhlman, L.	St. Joseph	Buchanan
Veach, S. J.	Osceola	St. Clair
Wickham, A. C.	Jefferson City	Cole
Witherspoon, B. H.	Gaines	Henry
Young, C. E.	Mound City	Holt

-64

STUDENTS OF THE SCHOOL OF MINES.

Alexander, George Ernest	Maryville	Nodaway
Anderson, Perry Barton	Neosho	Newton
Bradford, Robert Edward Lee	Spring Creek	Phelps
Branson, Charles Sylvester	Byron	Osage
Branson, Dennis Sydney	"	"
Brewster, James Madison	Macedonia	Phelps
Buskett, Mary Page	Rolla	"
Campbell, Eugene	"	"
Cansler, Gussie Kathrynne	"	"
Case, Allen Bertley	Lecoma	Dent
Clark, Charles Frederick	Lebanon	Laclede
Cleino, Charles Conrad	Rolla	Phelps
Connelly, George Joseph	Denver, Colo.	"
Cook, Edwin Wallace	Competition	Laclede
Corse, Lottie Edith	Rolla	Phelps
Cowen, Herman Cyril	Bethany	Harrison
Dean, George Walter	Rolla	Phelps
Deegan, Agnes Julian	"	"
DeLay, Theodore Stuart	Creston, Ia.	"
Dilworth, William	Salem	Dent

Name.	Postoffice.	County.
Donnan, David McAnally	Elk Prairie	Phelps
Donnelly, Arthur	Lebanon	Laclede
Donnelly, Sophia Mary	"	"
Dwyer, Edward	Joplin	Jasper
Dyer, Temple	Rolla	Phelps
Flett, Jame. Cyrus	Salem	Dent
Florreich, Philip	St. Louis	"
Flynn, Frank Nicholas	Denver, Colo	"
Freeman, Etna Josephine	Relfe	Phelps
Germann, Frank Arthur	Rolla	"
Gilbert, Richard William	"	"
Godwin, Annie Gill	"	"
Gormly, Samuel James	Mt Vernon, Ia	"
Grove, Claude Devlin	Gallatin	Daviess
Guenther, Eda Minnie	Rolla	Phelps
Hardin, Eva Augusta	"	"
Harper, William Joseph	Parsons, Kas	"
Harris, Walter Bibb	Melbourne, Ark	"
Harty, Bruce Arthur	Stoutland	Camden
Hawkins, Philip Cordell	Brumley	Miller
*Henderson, Harry Philip	St. James	Phelps
Henry, David Edward	Pleasant, Ind	"
Hitch, Arthur Martin	Cuba	Crawford
Hogan, Charles William	Lebanon	Laclede
Hollow, Henry Orlando	Cuba	Crawford
Hubbert, Guy	Neosho	Newton
Hughes, Richard Kingston	"	"
Iijima, Zentaro	Saitamaken, Ja	"
Irick, James Albert	Competition	Laclede
Jamison, Blanche	Rolla	Phelps
Johnson, Edward Mackay	"	"
Kennedy, William Price	"	"
Kerr, William Christian	St. Louis	"
Kilgore, Josephine	Rolla	Phelps
Knapp, Margaret Ann	Relfe	"
Lepper, Anna May	Rolla	"
Lepper, Jennie Edith	"	"
LeSueur, Ellen Virginia	Edgar Springs	"
Lewis, Lillian Jeanette	St. Louis	"
Livingston, Archibald Armstrong	Elk Prairie	Phelps
McCaw, Margaret	Rolla	"
McCracken, Lucy Ellen	"	"
McMullin, Richard Willie	Hillsboro	Jefferson
Madigan, Emma Rose	Rolla	Phelps
Madigan, Fannie Mary	"	"
Martin, Grace	Sullivan	Franklin
Meriwether, Carl	Rolla	Phelps
Millard, Linna	"	"
Millard, Sallie Elizabeth	"	"
Miller, Margaret	Crockett	Pulaski
Mitchel, Peter Reuben	Bakersfield	Ozark
Mitche l, Walter	Rolla	Phelps
Morgan, Minnie	"	"
Morris, Fanny Brown	"	"
Morris, Lola	"	"
Oatley, John Arthur	"	"
Phariss, Ida	"	"
Petraglio, Ama	"	"
Ponder, Abram Russell	Chehalis, Wash	"
Ried, John Calum	Pleasanton, Ks.	"
Richardson, Ethelyn Ann	Rolla	Phelps
Richardson, Grace Sarepta	"	"
Robertson, George Gordon	Cuba	Crawford
Rolufs, Rulof Theodore	Vest	Phelps
Rowe, Catherine	Rolla	"
Sappenfield, Estella Aurora	"	"
Sappenfield, Olive	"	"
Seay, Clifford Edward	Salem	Dent
Sharrar, May Dora	Rolla	Phelps
Shaw, Olive Helen	"	"
Smith, Tennie Estelle	"	"
Soest, Adele	"	"
Southgate, Margaret Barron	"	"
Spencer, Clifton Bates	Joplin	Jasper
Spencer, Herbert Galen	"	"
Stephenson, Lulu Elizabeth	Rolla	Phelps
Suppan, Leo Richard August	St. Louis	"
Tallman, Blanche	Crocker	Pulaski
Thomas, William Stephens	Bevier	Macon

*Died December 10, 1892.

Name.	Postoffice.	County.
Thompson, Frederick Lewis.....	Rolla.....	Phelps.....
Torrence, Leslie Clay.....	Pocahontas.....	Cape Girardeau.....
Tyrrell, Frank Lee.....	Sinkin.....	Shannon.....
Vaughan, Robert Edward Lee.....	Salem.....	Dent.....
Via, Jessie Miller.....	Rolla.....	Phelps.....
Walker, Jennie.....	".....	".....
Walker, John Edward.....	Vichy.....	Maries.....
Watson, John Adolph.....	Safe.....	".....
Weisenbach, Addie Marguerite.....	Rolla.....	Phelps.....
Welsgerber, Otto.....	Lebanon.....	Laclede.....
Wendt, Francis Eugene.....	St. James.....	Phelps.....
Whitley, Minnie.....	Rolla.....	".....
Wilkins, Elenor Matilda.....	".....	".....
Wood, Arthur Edward.....	".....	".....
Zelch, John Albert.....	Clayton.....	St. Louis.....
-114		

SUMMARY.

<i>Academic Students—</i>		<i>Professional Students—</i>	
Graduates.....	7	Agr'l and Mech'l } <i>a</i> , Regular.....	49
Seniors.....	15	} <i>b</i> , Special.....	294
Juniors.....	15	Normal { <i>a</i> , Regular.....	50
Sophomores.....	15	} <i>b</i> , Teachers' course.....	34
Freshmen.....	15	Law.....	57
Preparatory.....	112	Medical.....	39
Special.....	61	Engineering.....	64
Total.....	277	Military Science and Tactics.....	180
		Mining and Metallurgy.....	114
		Total.....	881
		Grand total.....	1153
		Names counted more than once.....	441
		No. of individual students.....	714

ENROLLMENT.

1. Academic Departments.

<i>a. Language.</i>	No. students.	<i>b. Science.</i>	No. students.
1. English.....	420	1. Metaphysics.....	40
2. Latin.....	254	2. Mathematics.....	390
3. Greek.....	77	3. Physics.....	210
4. Modern Languages.....	291	4. Chemistry.....	297
5. Hebrew.....	4	5. Geology and Mineralogy.....	67
6. Sanskrit.....	2	6. Biology.....	100

2. Professional Departments.

	No. students.		No. students.
1. Agriculture and Mechanic Arts.....	343	5. School of Mines and Metallurgy...	114
2. Normal Instruction.....	84	6. Engineering.....	64
3. Law.....	57	7. Military Science and Tactics.....	180
4. Medicine.....	39		

COUNTIES REPRESENTED IN THE UNIVERSITY.

Adair.....	1	Lincoln.....	7
Atchison.....	5	Lafayette.....	2
Andrew.....	4	Lewis.....	5
Audrain.....	4	Macon.....	4
Barton.....	17	Maries.....	4
Bates.....	1	Marion.....	5
Boone.....	201	Miller.....	3
Buchanan.....	10	Morgan.....	1
Benton.....	1	Montgomery.....	4
Butler.....	1	Moniteau.....	9
Cedar.....	1	Monroe.....	9
Clinton.....	5	Nodaway.....	5
Callaway.....	11	New Madrid.....	4
Cooper.....	7	Newton.....	3
Cape Girardeau.....	1	Osage.....	3
Chariton.....	8	Ozark.....	2
Caldwell.....	7	Putnam.....	7
Cass.....	10	Pettis.....	7
Carroll.....	7	Pike.....	13
Clay.....	2	Phelps.....	63
Cole.....	7	Platte.....	6
Camden.....	1	Pulaski.....	2
Crawford.....	5	Randolph.....	9
Dent.....	6	Ray.....	2
Davies.....	3	Ralls.....	3
Dade.....	1	Ripley.....	1
Franklin.....	3	Schuyler.....	1
Gentry.....	3	St. Louis.....	3
Grundy.....	6	St. Louis City.....	11
Greene.....	4	St. Charles.....	4
Gasconade.....	3	Shelby.....	6
Henry.....	5	Stone.....	1
Howard.....	3	Scott.....	3
Holt.....	6	St. Clair.....	2
Howell.....	1	Ste. Genevieve.....	3
Harrison.....	3	Scotland.....	2
Johnson.....	4	Saline.....	15
Jackson.....	20	St. Francois.....	2
Jasper.....	7	Vernon.....	8
Jefferson.....	7	Washington.....	2
Knox.....	4	Warren.....	3
Lawrence.....	4	Webster.....	1
Linn.....	6	Worth.....	3
Laclede.....	7	Number of counties represented.....	68
Livingston.....	5		

STATES, TERRITORIES AND FOREIGN COUNTRIES.

Arkansas.....	6	Missouri.....	683
Colorado.....	3	Montana.....	1
Illinois.....	5	Nebraska.....	1
Iowa.....	2	North Carolina.....	1
Japan.....	1	South Carolina.....	1
Kansas.....	4	Texas.....	4
Kentucky.....	1	Washington.....	1
Maryland.....	1	Total represented.....	15

Honorable Mention—1891-92.

Department of English—

MILTON ROBARDS CONLEY.

Department of Biology—

JOHN NELSON FELLOWS.

Department of Chemistry—

JOHN NELSON FELLOWS. WILLIAM MEADE SAMS.
FRANK O. RAY.

Department of Engineering—

JOHN NELSON FELLOWS.

Department of Geology and Mineralogy—

GEORGE LINCOLN BROWN. ROBERT CALDWELL.
JOHN NELSON FELLOWS.

Department of Greek—

MILTON ROBARDS CONLEY.

Department of Latin—

MILTON ROBARDS CONLEY. JAMES EDWARD GOODRICH.

Department of Law—

FRANK BLAKE. FRANK BAILLARD FULKERSON.
HARRY T. HERNDON. HORACE RUARK.
OSCAR BENTON TOALSON.

Department of Mathematics—

MILTON ROBARDS CONLEY. JOHN NELSON FELLOWS.
CASSIUS JACKSON KEYSER.

Mental and Moral Philosophy—

JAMES EDWARD GOODRICH. MARY MANSFIELD.
HARRIS LANCASTER MOORE.

Department of Military Science and Tactics—

SAMUEL F. CRECELIUS. WILLIAM E. GORDON.
AUSTIN B. GRIGGS. CHARLES G. HAINES.
ALBERT J. McCULLOCH. JOSEPH E. SMITH.
THOMAS W. THOMPSON. FRANK B. WICKHAM.

Department of Modern Languages—

GEORGE LINCOLN BROWN. MILTON ROBARDS CONLEY.
JOHN NELSON FELLOWS. CASSIUS JACKSON KEYSER.
WILLIAM MEADE SAMS. MARY MANSFIELD.

Department of Pedagogics—

MILTON ROBARDS CONLEY. JOHN NELSON FELLOWS.
SAMUEL ADAMS LYNCH.

Department of Physics—

MILTON ROBARDS CONLEY. JOHN NELSON FELLOWS.

Department of Sanskrit—

NEWTON T. ADAMS. MILTON ROBARDS CONLEY.

Department of Comparative Philology—

NEWTON T. ADAMS.

James S. Rollins Scholarships.

These scholarships have been awarded as follows:

In A. B. Course.....	JENNIE ADAMS	In S. B. Course	CORA EITZEN
In Engineering.....	FRANK O. RAY	In Medicine	{ WILLIAM D. LOCKWOOD
In Law.....	ISIDOR LOEB		{ RICHARD F. COOK.
		In Agriculture.....	WM. SCHULL BRETZ

GRADUATES OF 1892.

Academic College.

FIRST RANK WITH DISTINCTION.

Fellows, John Nelson, S. B. Keyser, Cassius Jackson, S. B.
Conley, Milton Robards, A. B., L. B.

FIRST RANK.

Sams, William Meade, L. B. Caldwell, Robert, S. B.
Brown, George Lincoln, S. B. Mansfield, Mary, L. B.
Lynch, Samuel Adams, L. B. Hart, Harry Gill, L. B.
Goodrich, James Edward, A. B. Adams, Newton T., A. B.
Dent, Lewis Lee, L. B.

SECOND RANK.

Selsor, Mark, S. B. Bronson, Harl Howard, A. B.
LaMotte, John H., S. B. Denny, James Milton, S. B.
Moore, Harris Lancaster, A. B. Hancock, Alice Virginia, L. B.

Law College (LL. B.)

Allen, James M.	Hinkle, John J.	Robinson, Omar E.
Beach, Alva W.	Locker, William H.	Rodgers, Robert D.
Blake, Frank	Manning, A. V.	Ruark, Horace C.
Bruce, George W.	Mayfield, Irwin W.	Rudy, Jules L.
Dunkin, Robert R.	Mayfield, Leander C.	Schaper, Jesse H.
Farley, Robert E.	Minton, Charles	Talbot, Demetrius W.
Fulkerson, Frank B.	Moyer, Linneus E.	Thompson, Burton M.
Hart, Harry G.	O'Mahony, Clarence	Tipton, Joseph C.
Herndon, Harry T.	Poague, Henry F.	Toalson, Oscar B.
	Willis, John S.	

Engineering College.

Crecelius, Samuel F., C. E. Fellows, John N., Top'l E.
Ray, Frank O., Top'l E.

SURVEYOR'S CERTIFICATE.

Hunter, Thomas E. Doty, Augustus H.

College of Agriculture and Mechanic Arts.

Tandy, John L. (B. Agr.)

Normal College (Pe. B.)

Adams, Newton T.	Denny, James M.	Lynch, Samuel A.
Bronson, Harl H.	Fellows, John N.	Mansfield, Mary
Bronson, George L.	Hancock, Alice V.	Moore, Harris L.
Caldwell, Robert L.	Hancock, Etta	Sams, William M.
Conley, Milton R.	LaMotte, John H.	Selsor, Mark.

CERTIFICATE.

Harris, Herman F.	Dillon, John W. S	Shull, Rena Mary
Baldwin, Carrie E.	Hoffman, Gustave A.	Gordon, Miller R.
McKinley, Gertrude	Sanderson, Sarah J.	Bear, Alfred S.
Boyer, Monta J.	Briegleb, Charles F.	Smith, Clyn.
Gwinn, Arthur	Doyle, John H.	Butcher, Laura E.
Williams, David E.	Hudgins, Warren T.	Adams, Vinnie
Lynch, Dora A.	Miller, Mary E.	Powell, Bessie
Harris, Orienne	McClement, Belle	Dawes, Hamilton M.

Military Certificate.**FIRST RANK WITH DISTINCTION.**

Crecelius, S. F.	Smith, J. E.	Griggs, A. B.
McCulloch, A. J.	Thompson, T. W.	Haines, C. G.
Gordon, W. E.	Wickham, F. D.	

FIRST RANK.

Balthis, F. S.	Duncan, J. J.	Stone, Kimbrough.
Campbell, W. T.	Holman, J. H.	Taylor, T. J.
Fellows, J. N.	McBurney, H. G.	

SECOND RANK.

Allen, E. T.	Dillon, J. W, S.	Niedermeyer, F. W.
Allen, J. M.	Ficklin, W. H.	Granger, O. W.
Bear, A. S.	Mitchell, H. R.	

Masters' Degrees.

Oliver, T. J., S. B. class '73, S. M.	Theilman, Robert, S. B. class '83, S. M.
Miles, George W., S. B. class '84, S. M.	Smith, James Allen, A. B. class '85, A. M.
Froley, John W., S. B. class '88, S. M.	Stumberg, Charles H., A. B. class '89, A. M.
Coleman, Nancy, A. B. class '89, A. M.	G. Ward Kemp, LL. M.

Honorary Degree (LL. D.)

John Davison Lawson, B. C. L., Professor of Law in the University of the State of Missouri.

GRADUATE COURSES.

The following courses have been arranged and are offered with primary reference to the wants of graduates of this University who aim at a Master's or Doctor's degree; but they are open to graduates of other reputable Universities and Colleges, and even to such under-graduates of exceptional ability and attainment as may profit by them.

The regulations adopted by the Faculty with respect to Master's and Doctor's degrees are as follows:

Requirements for the Master's Degree.

Applications for the Master's degree will be considered on the basis of one year's graduate study at this University, in one or more departments.

1. One year's study is understood to mean at least four courses of three hours per week throughout the scholastic year, or the full equivalent thereof.
2. All the courses may be taken in one department, and at least half must be.
3. The courses must all be of advanced character, and not open to a student below the Junior year.
4. There shall be appointed annually a Committee on Higher Degrees, before which all applications for such degrees, with the courses chosen, shall be laid before November 1 of each year, and by whom such courses may be approved or modified, and recommended to the General Faculty. This same committee shall also recommend candidates at the close of the scholastic year to the General Faculty.

Requirements for the Doctor's Degree.

The requirements for the degree of Doctor of Philosophy or of Science are:

1. That the candidate shall have received a Bachelor's degree (in Arts, Letters, Science, or Philosophy) from some reputable University or College.
2. That he shall have attained, in a current graduate study pursued at this University, a high proficiency in some one branch of learning and respectable proficiency in at least one other.
3. That he shall have submitted a dissertation evincing capacity for original research and power of independent thought.

The attainment of the doctorate is not a mere matter of fidelity nor of diligence, nor of duration of effort. No definite course can be prescribed and no period of time specified, but in general the candidate will be expected to spend three years, or if he have a Master's degree, two years, in graduate study under University direction; but with Faculty approval one of these years may in either case be spent *in absentia*.

I. Department of English.

Courses 1, 2, 4, 5, 6, presuppose some knowledge of Anglo-Saxon and German; course 3 presupposes, in addition, some knowledge of Latin and French.

Professor ALLEN:

1. Anglo Saxon Poetry. Beowulf (Harrison and Sharp); Judith (Cook), or Cynewulf's Elene (Kent), or Caedmon's Exodus and Daniel (Hunt). Two hours a week, first and second semesters.

2. Middle English (1150-1400). Skeat's Specimens, part I; Ten Brink's Chaucer's *Sprache und Verskunst*. Two hours a week, second semester.

3. Anglo-French Element in English. Skeat's English Etymology, 2nd series; Behren's *Beitraege zur Geschichte des Franzoesischen Sprache in England*.

Professors PENN or BOWEN and WAUCHOPE:

4. Gothic. Wulfla (Balg); Braune's Grammar. Two hours a week, first and second semesters.

5. Old Saxon. Heliand (Heyne). Two hours a week, second semester.

6. Anglo-Saxon Grammar, Phonology. Sievers' Grammar of Old English (Cook). Two hours a week, first or second semester.

7. Origin and Development of the English Drama. Lectures. Two hours a week, second semester.

II. Department of Latin.

The following courses presuppose the under-graduate classical course as given in this University, or its equivalent: that is, about five or six years' study of Latin Language and Literature:

Professor JONES:

1. Critical study of a selected author, three times a week, both semesters.

This course will be accompanied by the presentation of papers and discussions on special topics. While it is intended chiefly for graduate students, it will be open to others of suitable preparation.

2. Historical Latin Grammar, twice a week, both semesters.

This course embraces a general survey of the syntax of the cases, moods and tenses from a historical standpoint. Some group of constructions will then be taken up and carefully studied. This course must be preceded by course 3.

3. Early Latin, twice a week, second semester. This course will embrace the study of Latin Grammar on the side of forms and inflections and must precede course 2. Allen's Remnants of Early Latin, supplemented by lectures.

4 Introduction to Latin Epigraphy and Palæography, twice a week, first semester. This course is intended to give the student practice in reading inscriptions and manuscripts in fac-similes. The basis of the work will be *Cours d'Epigraphie latine* (Cagnat).

Professor BURNAM:

5. (a) Lucretius (*De Rerum Natura*), three hours a week, both semesters with Cicero, (*De Natura Deorum*) as private reading. (b) Tacitus Annals I—VI, three hours a week, both semesters, with Suetonius' Tiberius Nipperdey's edition is used, and therefore a reading knowledge of German is required.

6. Roman Public Law, three hours a week, both semesters. Lectures by the instructor and reading by the class of W. Warde Fowler's *City-State* (1893).

7. Roman Private Law, two hours a week first semester, and continued in the second if the class desire it. Justinian's Institutes read in the class and a full commentary supplied by the instructor, with a short sketch of the History of Roman Law. Text-book: Holland.

8. Roman Private Life, two hours a week first semester, and continued during the second at the option of the class. Text-book: Marquardt's *Roemisches Privatleben* or the French translation by V. Henry.

III. Department of Greek.

GREEK LANGUAGE AND LITERATURE.

Professor MANLY:

1. Historical Grammar of the Greek Language. Two hours a week, both semesters. Applicants for this course should have had the courses required for the A. B. degree in this University, or an equivalent.

2. Homeric Literature and Antiquities. Two hours a week, two semesters. Requirements for admission similar to those above.

ARCHÆOLOGY.

Professor PICKARD:

1. History of Greek Art. Three hours a week, both semesters.

2. Greek Epigraphy. One hour a week, both semesters.

3. Archaeological Seminary. Two hours a week, two semesters.

4. History of Greek Vases and Vase-painting. One hour a week, first semester.

5. Greek Ideals of the Gods. One hour a week, second semester.

6. History of Etruscan and Græco-Roman Art. Two hours a week, second semester. The first semester of course 1 is a prerequisite to this course.

In course 2 only is a knowledge of the Greek language required, but it is extremely valuable in all of them.

IV. Department of Modern Languages.

The courses below presuppose that the work as outlined in the University catalogue has been done.

Professor BLACKWELL OR HOFFMAN:

1. Middle High German; the Grammar (Paul); the Nibelungenlied.

Lectures on Old High German language and literature, and Comparative Teutonic Philology. Two hours a week, first and second semesters.

Professor BLACKWELL OR HOFFMAN:

2. Old French (Bartsch); Provençal (Kitchin). Two hours a week, first and second semesters.

Professor WIENER:

3. Russian. Studies in Gogol and Nikrassof. Once a week, first and second semesters.

Professor BLACKWELL:

4. Italian. Dante's Inferno; lectures on the revival of learning in the Middle Ages in Italy. Once a week, first and second semesters.

Professor WIENER:

5. Spanish. Studies in the Cancioneros, in Catalan, and the History of the Literature. Once a week, two semesters.
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V. Department of Semitic Languages.

Professor BLACKWELL:

1. Hebrew: Pirke Abboth (Taylor); the Midrashim (Stark). Twice a week, two semesters.

2. Arabic: The Quran (Bagster), Noeldeke's Geschichte. Twice a week, two semesters.

3. Aramaic, Western (Syriac) and Eastern (Chaldee), Nestle's and Brown's texts. Two hours a week, two semesters.

VI. Department of Mathematics and Astronomy.

The following courses presuppose about three years of collegiate study in Solid Geometry, Trigonometry, Advanced Algebra, Co-ordinate Geometry, Determinants, and Infinitesimal Calculus.

Professor SMITH:

1, 2. Differential Equations. Four times weekly, both semesters.

Forsyth's Treatise on Differential Equations.

3, 4. Elliptic Functions. Four times weekly, both semesters. Halphen's *Traite*, Vol. I, supplemented from Briot and Bouquet's *Theorie*, etc.

5, 6. Elliptic Functions. Four times weekly, both semesters. Halphen's *Traite*, etc., Vol. II. A continuation of courses 3, 4.

7, 8. Mathematical Seminary. Twice weekly, both semesters. For orientation in various disciplines and for incitement to original research. The subjects treated in 1892-93 were Probability (Czuber) and Higher Spaces (Killing).

Professor TINDALL:

9, 10. Infinitesimal Calculus. Six times weekly, both semesters. Greenhill's Calculus, 2d Edition.

11, 12. Theory of Equations and Quantics. Thrice weekly, both semesters. Burnside and Panton's Theory of Equations.

13, 14. Theory of Substitutions. Twice weekly, both semesters. Cole's *Netto's* Treatise on the subject. A continuation of courses 11, 12.

15, 16. Solid Analytic Geometry. Thrice weekly, both semesters. Frost's Treatise on the subject.

Professor UPDEGRAFF:

A course in General Astronomy, as Young's, is presupposed.

17, 18. Practical Astronomy, including orbit determination. Four times weekly, both semesters. Chauvenet's Spherical and Practical Astronomy and Watson's Theoretical Astronomy.

19, 20. Spectrum Analysis as applied to the heavenly bodies. Four times weekly, both semesters. Schellen's Spectrum Analysis, Scheiner's *Spectral-Analyse der Gestirne*. All of the foregoing courses were given in 1892-93 except 5, 6, 13, 14, now offered for the first time, and 19, 20, which were given in 1891-92. Instead of 5, 6 (Applications of Elliptic Functions), there may be given, according to demand, like courses in Higher Plane Curves, based on Salmon's work.

Courses 9, 10, 11, 12 are under-graduate, but may be taken with advantage by most graduates.

VII. Department of Chemistry.

The following courses presuppose all the prescribed work in the Science course in this University—that is, they presume in the candidate a good knowledge of general Chemistry, practice in Qualitative and also Quantitative Analysis, and a fair acquaintance with Chemical Theory:

Professor SCHWEITZER:

First Semester:

1. Solutions; 3 hours a week. Ostwald, Lehrbuch.
2. Exercises in Mineral Analysis; 10 hours a week.
2. Exercises in the use of the Spectroscope, Spectro-photometer and Polaristrobrometer; 2 hours a week.

Second Semester:

1. Problems in Agricultural Chemistry; 3 hours a week.
2. Study of Analytic Methods, including those of foods and feeding stuffs; 8 hours a week.
3. Sanitary investigation of air, food, water; 4 hours a week.

It is expected that 1, 2 and 3 be taken together, both courses being intended to fit young men for the active duties of laboratory instruction, as well as for the practice of the art of analytical chemistry.

VIII. Department of Physics.

There is presupposed such training in Physics as is given in the Scientific and Engineering courses in this University, or its equivalent.

Professors LIPSCOMB and SHRADER:

1. Mathematical Theory of Electricity and Magnetism. Three times weekly, first semester.

3. Thermometry and Calorimetry, Laboratory. Three times weekly, first semester.

5. A course in Dr. Hertz's Researches on Electrical Oscillatory Induction. Twice weekly, first semester.

2. Absolute Measurements in Electricity and Magnetism (Gray.) Three times weekly, second semester.

4. Thermodynamics (Wood.) Four times weekly, second semester.

6. Advanced Laboratory course in Mechanics, Sound, Heat, Spectrum Analysis and Electricity. Three times weekly, second semester.

IX. Department of Geology.

Professor CLENDENIN:

1. Petrographic research with laboratory work and theses. Original investigation. Two hours weekly, first semester.

Professor BROADHEAD:

2. Palaeontology. This is a continuation of the under-graduate Palaeontologic work, and its aim is to make practical Palaeontologists. Includes field work, laboratory, drawing of fossils and theses. Two hours a week, first semester.

Professor CLENDENIN:

3. Optical crystallography and determination of Minerals. Lectures, laboratory and goniometric work. Drawing of crystals.

Geological conference with reports, theses, discussion of geologic problems, original investigations and field work. Three hours a week, second semester.

Professor BROADHEAD:

4. Studies in the Geology of Missouri, laboratory and field work. Both semesters.

X. Department of Biology.

The following advanced courses presuppose a knowledge of the usual under-graduate work in Botany and Zoology, Anatomy and Physiology, and the Elements of Histology.

Professor PURINTON:

1. General Biology; Lectures on Vegetable Histology; Physiological and Structural Botany; Comparative Anatomy of the Vertebrates, and Animal Histology.

2. The second year's work for students who have taken (1) is more advanced in character, and includes a critical study of Economic and Cryptogamic Botany, Embryology, Dissections of Vertebrates and Invertebrates, and preparation of permanent specimens for the museum and herbarium, and the preparation of theses.

3. For students who have had considerable under-graduate work in Biology, and who are candidates for the degree of Doctor of Philosophy, two years of advanced graduate work are offered, the exact nature of which may vary from year to year with the special requirements of the case, embracing much reading and original research, and necessitating the preparation of frequent dissertations or theses on the part of the student, descriptive of his own research.

The last year's work must be continuous and original, and may form the basis of the graduating thesis of the student.

Constant reference is made to the leading authors on Biologic Science. The student will often be required to read an author, and to experimentally follow his researches, reproducing and verifying his results as far as practicable.

4. Special direction will be given to the study of Biology in its application to Medicine in case of those desiring to devote themselves to medical pursuits.

XI. Department of Law.

This course is open to graduates of the two years' course in the Law department of this University and to graduates of other Law schools who have completed a similar or equivalent course. It extends through one Academic year. Such as pass the prescribed examinations upon it will receive the degree of LL. M. (Master of Laws).

Professor MARTIN:

1. Constitutional Law.
2. Law of Trusts.
3. Law of Patents and Copyrights.

Professor LAWSON:

4. Law of Insurance.
5. Law of Homicide.

Professor YANTIS:

6. Law of Corporations.

Professor HICKS:

7. Theory of Jurisprudence.
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XII. Normal Department.

The following courses are offered:

Professor BLANTON:

1. First Semester, Junior Year: History of Education. Lectures and Recitations. Texts: Compayre's History of Pedagogy, Quick's Educational Reformers.
2. Second Semester, Junior Year: Theoretical and Critical. A consideration of the philosophic basis of education. Lectures and Recitations. Texts: Compayre's Lectures on Pedagogy, Rosmini's Method in Education.
3. First Semester, Senior Year: Philosophy of Education. Text: Rosenkrantz's Philosophy of Education, with an examination of Herbart's System.
4. Second Semester, Senior Year: Application of the preceding principles to the various phases of actual instruction and school management. Lectures and Recitations. Texts: Compayre's Lectures on Teaching, Page on Teaching.
5. First Semester, Junior Year: School Systems of Europe. Lectures and Recitations. Texts: Gill's Systems of Education; Klemm's European Schools.
6. Second Semester, Junior Year: Philosophy of the Kindergarten. Lectures and Recitations. An examination of Froebel's "Education of Man" will be made by the class.
7. First Semester, Senior Year. A thorough examination of Herbert Spencer's Educational Theories.

8. Second Semester, Senior Year: A comparative study of the school systems of the cities and states of the United States. "Boone's Education in the United States" will be read, and many of the circulars of information issued by the Bureau of Education will be available in pursuing this investigation. Two hours a week in Junior; three hours a week in Senior.

The foregoing courses, offered to Junior and Senior under-graduates in this University, are open and recommended to graduates of Colleges and Universities in which less provision is made for discipline in Pedagogics.

XIII. Department of Electrical Engineering.

Courses 1 and 2 presuppose a knowledge of Thompson's Dynamo—electric Machinery. Courses 3 and 4 presuppose a knowledge of the Differential and the Integral Calculus.

Professor SHRADER:

1. The Electric Motor and its Applications. Three times per week, first semester. The course will cover the development of the practical electric motor up to the present time.

2. The Electric Railway. Three times a week, first semester. A study in detail of motors, their peculiarities and their present use in the electric railway.

3. The Alternate Current Transformer. Text: Fleming's Alternate Current Transformer. Three times a week, both semesters. A study of the principles that underlie the operations and use of the alternate current transformer.

4. Advanced Laboratory Work. Text: Mascart and Joubert's Electricity and Magnetism, Volume II. Three times a week, second semester. Electrical testing of all kinds.

INDEX.

	Page		Page
Academic Departments	7	Department of Comp. Philology	16
Academic Faculty	7-8	English	9
Academic Valedictorian	78	Engineering department	65-71
Academic Courses	30-31	Geology and Mineralogy	24
Admission to the University—		Greek	12
College of Agr. and Mech. Arts...	41	History and Political Economy....	16
Engineering department.....	66	Latin	10
Freshman class.....	30	Law.....	54-60
Law department	58	Mathematics and Astronomy.....	17-20
Medical department.....	62	Medical	61-64
Military department	74	Mental and Moral Philosophy.....	17
Mines and Metallurgy.....	123	Military	72
Normal department	52	Mining and Metallurgy	84-96
from approved High schools.	34	Modern Languages.....	13
Alumni	82	Normal	51-53
Approved Schools.....	35	Physics	20
Art department	74	Sanskrit	16
Biology	27	Semitic Languages.....	15
Board of Visitors.....	1	Degrees	73-79
Boarding	81	Directions for new students	77-78
Calendar of University and School of		Discipline	78
Mines	19	Elocution	74
Certificates	79	English department	9
Chapel services and attendance	78	Engineering department	65-71
Chemical department	23	Admission	66
Classical Archæology	13	Civil Engineering	66-63
Class-cards	78	Courses	66
Club-houses	81	Electrical Engineering.....	69-70
College of Agr. and Mech. Arts—		Faculty	65
Admission	41	Mechanical Engineering.....	70-71
Courses	42-50	Enrollment in all departments	107
Degrees	49	Examinations—	
Enrollment.....	50	Entrance	77
Experiment Station	39	Re-examinations	78
Faculty	38	Special.....	78
General information.....	41	Experiment Station	39
Mechanic Arts.....	45	Faculty	2-5
Veterinary science	44	Farmers' Institutes.....	75
Commercial course.....	46	Fees.....	79-83
Comparative Philology	16	Geology and Mineralogy.....	24
Counties represented	108	Graduates of approved High Schools..	
Curators	1	(note)	35
Date of meeting	19	Graduates of 1892	110-111
Officers	1	Graduate courses	113-121
Report to Governor	VIII	Greek department	12
Departments of the University.....	6	Historical Statement	VI
Agr. and Mech. Arts.....	38-50	History and Political Economy	16
Art.....	74	Honorable Mention.....	109
Biology	27	Horticulture.....	43
Chemistry	2	Latin department	10

	Page		Page
Latin prize	11	Military Staff.....	72
Law department	54-60	Department, State Cadets	73-74
Admission	58	Modern languages.....	13
Courses	56-58	Museum	28
Degrees	59	New buildings	VII
Enrollment	59	Normal department.....	51-53
Faculty	54	Courses	52
Fees	60	Degrees	52
Graduate Course	57-58	Faculty	51
Opening and closing	59	Observatory	19-20
Library	75-77	Physics department	20
Local Chapters of Alumni Association.	83	Prizes.....	79
Literary societies.....	81	Preparatory courses.....	32
Manual Training School	45	Professional departments.....	37
Mathematics and Astronomy.....	17-20	Preparatory courses discontinued	34
McAnally Medal	10	Resident graduates.....	80
Mechanic Arts.....	45	Rollins Aid fund	81
Medical department—		Rollins Scholarships	80-81
Admission and courses.....	62	Sanskrit	16
Degrees	63	Semitic Languages	15
Faculty	61	States represented.....	108
Requirements for graduation. .	63-64	Students of University	97
Mental and Moral Philosophy.....	17	Students of School of Mines	103-106
Mining and Metallurgy	84 96	Summary	107
Building and Equipments.....	93	Teachers' Course.....	75
Courses	85 86	University—	
Degrees	95	Departments	6
Departments	87-92	Date of opening and closing.....	IV
Expenses	94	Founding of professional depart-	
Faculty and Officers	84	ments.....	VI
Library	94	Students	97-106
Students	105-106	When founded and how sustained.	VI
Ministers and students preparing for		University Extension	75
the ministry.....	80	Veterinary Science	44
Military department	72	Young Women.....	77
Admission.....	74	Young Women's Christian Association	82
Courses	73	Young Men's Christian Association...	82

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